COMPOSITION AND LAYOUT DESIGN OF SEVENTEENTH CENTURY DEVANAGARI MANUSCRIPTS IN MAHARASHTRA AND MODERN GRAPHIC DESIGN: A COMPARATIVE STUDY OF DESIGN CONCEPTS

A Thesis submitted to the
Tilak Maharashtra Vidyapeeth, Pune
For the Degree of Doctor of Philosophy (Ph.D.)

In Indology Subject
under the Board of Arts and Fine Arts

Submitted By
Pranita Ranade

Under the Guidance of
Dr. Prakash Joshi

March 2017

DECLARATION

I hereby declare that the thesis entitled “Composition and layout design of seventeenth century Devanagari manuscripts in Maharashtra and Modern Graphic Design: A comparative study of design concepts” completed and written by me has not previously formed the basis for the award of any degree or other similar title upon me of this or any other Vidyapeeth or examining body.

Research Student

Place : Pune

Date : 28 March, 2017

CERTIFICATE

This is to certify that the thesis entitled **"Composition and layout design of seventeenth century Devanagari manuscripts in Maharashtra and Modern Graphic Design: A comparative study of design concepts**" which is being submitted herewith for the award of the **Degree of Vidyavachaspati (Ph.D.) in Indology** of **Tilak Maharashtra Vidyapeeth**, Pune is the result of original research work completed by Smt. Pranita Ranade under my supervision and guidance. To the best of my knowledge and belief, the work incorporated in this thesis has not formed the basis for the award of any Degree or similar title of this or any other university or examining body upon her.

Research Guide

Place : Pune

Date : 28 March, 2017

ACKNOWLEDGEMENT

This has been an unusually a long journey, and I have incurred so many debts along the way that it is impossible for me to account for all of them. I would like to thank people who are majorly involved in the outcome of this project.

I wish to place on record my profound sense of gratitude to my research guide, Dr. Prakash Joshi, whose kindness, patience and encouragement were the most important factors in the completion of this undertaking. Dr. Joshi's insights in the discipline of the research, interpretations of facts and constant encouragement and guidance were the most important factors in the completion of my research. Insightful discussions with Dr. Joshi are as unforgettable as remarkable hospitality extended by him and Mrs. Joshi.

I express my gratitude to Prof. (Dr.) Shripad Bhat, Dean and HoD S. B. L. Centre of Sanskrit and Indological Studies, Board of Arts and Fine Arts for the extended support and for being always supportive. I wish to thank Prof. (Dr.) Manjiri Bhalerao for opening the amazing world of history of Indian Art & Design through the master's degree course in 'Indology'. Her inspiring lectures always helped me knowing the history of Indian Art and Design deeply. I am thankful to the staff of Tilak Maharashtra Vidyapeeth — Indology Department.

I owe my sincere thanks to the management and the staff of the manuscript repositories, Dr. Shreenand Bapat from 'Bhandarkar Oriental Research Institute; Mr. Vaishampayan, Mr. Dongre, Dr. Chitale, and Mrs. Veena from 'Samartha Vagdevata Mandir', Dhule; Dr. Trupti More and library staff of 'The Deccan College and Post Graduate Research Institute'; Mrs. Vrinda Dharap of 'Bharat Itihas Samshodhak Mandal'; Mr. Apte and Mrs. More from 'Anandashram'; library staff at the 'Vedic Samshodhan Samsthan'; Dr. Shubhada Nagarkar from 'Savitribai Phule Pune University'; Dr. Meena Vaishampayan from 'Asiatic Society', Mumbai, Mr. V. L. Manjul, and Dr. Dhawedkar. Without their co-operation and support, I would have hugely struggled to get the research material on which this thesis is substantially based upon.

I am thankful to Dr. Sudha Joshi, Dr. Rama Golwalkar, and Dr. Kanchana Bhaisare for their support in various research-related activities.

I take this opportunity to express the gratitude to ‘Symbiosis International University’ and ‘Symbiosis Institute of Design’ for conducting research-related faculty development programmes to enrich faculty members in the research area and providing an opportunity to access library resource. I wish to thank Ms. Vidya and Ms. Urmila — library staff, who provided unconditional support in accessing library material. I thank Prof. Keyur Sahasrabudhe for making available camera equipment for the research work.

In any effort of this order lasting over several years, the support of one’s family is very critical. My husband, mother, brother, relatives, well-wishers, friends, colleagues and blessing of my father and mother-in-law were a perennial source of encouragement. Their love provided the zest that life needs over several years for a specific achievement.

I duly acknowledge the kind support of Dr. Deepak Tilak, Vice Chancellor of Tilak Maharashtra Vidyapeeth, Pune, and the staff at the Ph.D. section, for their strong support and co-operation in completing this task.

Place : Pune

Date : 28 March, 2017

Table of Contents

Chapter 1: Introduction

1.1 Introduction 1

1.2 Background / Cultural and Historical Relevance of Design Concepts in India 2

1.3 Need of Research 5

1.4 Purpose of the Study: Problem and Significance 6

1.5 Primary Research Questions 7

1.6 Hypothesis 7

1.7 Research Design 7

1.8 Conceptual Framework 8

1.9 Scope and Limitations of Research 9

1.10 Outline of the Thesis 10

Chapter 2: Literature Review

2.1 Introduction 12

2.1.1 Aim of Literature Review 13

2.1.2 Research Objectives 13

2.1.3 Research Model for Literature Review 14

2.2 Overview of Devanagari Script 14

2.2.1 Origin 15

2.2.2 Systematic and Linguistic Features of Devanagari Script 16

2.2.3 Devanagari Calligraphy 17

2.3 Previous Studies in Indian Manuscript Design 19

2.3.1 Definition of 'Manuscript' 20

2.3.2 Subjects handled and Types of Manuscripts 20

2.3.3 Medium of Writing 21

2.3.4 Template Design Tools 22

2.3.5 Manuscript Writing Tools and Instruments 22

2.3.6 Ink 24

2.3.7 Sizes and Forms of the Manuscripts 25

2.3.8 Schematic Structure of the Manuscripts 26

2.3.9 Grids and Columns 28
2.3.10 Composition and Editorial Styles of Indian Manuscripts 29
2.3.11 Design Features of Indian Manuscripts 31
2.2.12 Calligraphy 32
2.3.13 Colour, Images and Visual Hierarchy 33
2.3.14 Illustrations, Illumination and Decorative Patterns 35
2.3.15 Page Numbering 37
2.3.16 Accent Marks 37
2.3.17 Abbreviations 38
2.3.18 Marginalia 38
2.3.19 Segmentation / Section/ Separation / Punctuation Marks 38
2.3.20 Binding Types and Techniques 39
2.3.21 Scribe and Scribal Errors 40
2.4 Overview of Manuscript Design Trends in Other Countries 41
2.4.1 Types of manuscripts 41
2.4.2 Layout and Composition – Grid, Structure and Form 42
2.4.3 Design Features 43
2.4.4 Calligraphy 45
2.4.5 Initials 46
2.4.6 Punctuation / Segmentation / Phonetic Marks 47
2.4.7 Binding 47
2.5 Graphic Design and its Role in Communication Design 47
2.5.1 Definitions of Graphic Design 49
2.5.2 Modern Graphic Design 50
2.5.3 Features of Graphic Design 51
2.5.4 Book Design and its Alliance with Modern Graphic Design 52
2.5.5 Components of Page 54
2.5.6 Form and Function of Publication Design 55
2.5.7 Structure of Page Layout using Columns and Grids 56
2.5.8 Layouts and Compositions of Publication Designs 60
2.5.9 Orientation of Elements on Page 62
2.5.10 Navigation System in Publication Design 63

2.5.11 Typography and Publication Design 63
2.5.12 Typography –Visual Hierarchy and Line Length 64
2.5.13 Role of Letter Spacing and Word Spacing 66
2.5.14 Use of Paragraphs 66
2.5.15 White Space and Compositions 67
2.5.16 Grouping and Chunking of Data 68
2.5.17 Alignment and Balancing of Content 68
2.5.18 Colour an Influential Tool in Composition 69
2.5.19 Visual Appeal through Imagery 69
2.5.20 Appropriation 71
2.5.21 Consistency and Visual Harmony in Layout 71
2.5.22 Size Relationship 71
2.5.23 Compositional flow 71
2.6 Use of Technology in Publication Design 72
2.6.1 Use of Master Pages, Templates, and Paragraph Style in Publication Design 73
2.7 Summary of Literature Review 73

Chapter 3: Research Methodology

3.1 Research Methodology 75
3.1 Introduction 75
3.2 Approaches to the Problem 76
3.3 Reason for Choice of the Topic 78
3.4 Title of the Thesis 78
3.5 Objectives of the study 78
3.6 Hypothesis of the Study 79
3.7 Proposed Study 79
3.8 Assumptions 80
3.9 Research Design and Methodology 80
3.9.1 The Universe 80
3.9.2 Selection of the Sample 81
3.9.3 Period of the Study 82
3.9.4 Tools used for collection and Synthesis of Data 82

3.9.5 Primary Data: 82
3.9.6 Secondary Data 83
3.10 Significance of the Study 83
3.11 Scope and Limitations of the Study 84
3.12 Method of Data Collection 85
3.12.1 Sequence of Steps followed in Collecting Primary Data 86
3.12.2 Secondary Data 87
3.13 Techniques of the Data Analysis 87

Chapter 4: Data Analysis and Findings

Introduction 89
Research Method and Procedure 89
Thematic Categories of the Manuscripts – Conceptual Framework 91
Classification of Representative Manuscripts based on Graphic Design Features: 91
4.1 Theme 1: Form and Function of Devanagari Brahmanical Manuscripts and Modern Publication Design 92
4.1.1 Aims and Objectives 92
4.1.2 Approach to Study Forms and Functions of Manuscripts 92
4.1.3 Data Collection 92
4.1.3 - (a) Page Formats 92
4.1.3 - (b) Page Turning System and its Association with the Reading Pattern, Text Flow, and Eye Movement of the Reader 97
4.1.3 - (c) Text Flow Direction 100
4.1.3 - (d) Page Imposition and Binding Systems 104
4.1.4 Findings of Theme 1: Form and Function of the seventeenth century Devanagari Brahmanical Manuscripts 109
4.1.5 Comparative Analysis of Forms and Functions of Representative Seventeenth Century Devanagari Brahmanical Manuscripts 114
4 .2 Theme 2: Composition and Layout Design: Page Structure, Typography, and Graphic Strategies 116
4 .2.1 Aims and Objectives 116
4 .2.2 Approach to Study Composition and Layout Design of Devanagari Brahmanical Manuscripts and Modern Books 116
4.2.3 (a) Page Anatomy — Structure of a Page 117
4.2.3 (b) Grid System in the Page Layouts 120

4.2.3 (c) Type Styles and Paragraph Alignments 141

4.2.3 (d) Graphic Strategies 150

4.2.4 Findings of Theme 2 — Composition and Layout Design: Page Structure, Typography, and Graphic Strategies 163

4.2.4 (a) Page Anatomy and Structural Components 163

4.2.4 (b) Grid Construction and Template Designing 165

4.2.4 (c) Typographic Palette — Typestyles and Alignments 176

4.2.4 (d) Graphic Strategies 182

4 .3 Theme 3: Layout Styles and Fundamentals of Page Layout Principles 188

4 .3.1 Aims and Objectives 188

4.3.2 Approach to Study Composition and Layout Designs: Layout Styles and Fundamentals of Page Layouts Principles of Devanagari Brahmanical Manuscripts and Modern Books 189

4.3.3 Part A Organization of Information in Manuscripts and Modern Books . 189

4.3.3 - Part A (1a): Segments of the Seventeenth Century Devanagari Brhamnanical Manuscripts 189

4.3.3 - Part A (1b): Segments of the Modern Books 193

4.3.3 - Part A (2): Layout Editorial Styles and Structure 195

4.3.3 - Part A (2a): Layouts Editorial Styles — Seventeenth Century Devanagari Brahmanical Manuscripts 195

4.3.3 - Part A (2a-1) Type 1: Text Based Layout with Single Text 195

4.3.3 - Part A (2a-2) Type 2: Multiple Texts Layouts with Bilingual Text; (Text with Commentary) 198

4.3.3 - Part A (2b) Layouts Editorial Styles —Modern Books 203

4.3.3 - Part A (b2-1) Type 1: Layouts Styles — Text Based Layout with Single Text 204

4.3.3 - Part A (b2-2) Type 2: Layouts Styles - Text Based Layout with Bilingual Text 207

4.3.3 - Part A (b2-3) Type 3: Layouts Styles - Appropriation in Page Layouts ... 210

4.3.3 - Part A (c): Page Navigation System 212

4.3.3 - Part A (c1): Page Navigation System — Seventeenth Century Devanagari Brahmanical Manuscripts 212

4.3.3 - Part A (c2): Page Navigation System — Modern Publication Design 213

4.3.4 Part B: Page Layout Principles 215

4.3.4 Part B (1): Chapter Opening Pages — Entry Point 216

4.3.4 Part B (2): Fundamental of Design and Page Layout 220

4.3.5 Findings of Theme 3: Composition and Layout Designs: Layout Styles and Fundamentals of Page Layouts Principles 232

4.3.5 Part A (1): Organization of Information in the Manuscripts and the Modern Books 232

4.3.5 Part A (2): Layout Editorial Styles and Structure 234

4.3.5 Part B : Page Layout Principles 237

4.3.5 Part B (1): Entry Point 237

4.3.5 Part B (2): Contrast, Proportion, Emphasis, Visual Hierarchy, and Colour 237

4.3.5 Part B (3): White Space 238

4.3.5 Part B (4): Balance in the Page Layout 239

Chapter 5: Discussions and Conlusions

5.1 Correlation with the Previous Research 241

5.2 Summary of Research 243

5.2.1 Form and Function of the Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Design 243

5.2.1 (a) Page Formats 243

5.2.1 (b) Page Turning System, Text Flow Direction 243

5.2.1 (c) Page Imposition and Binding System 244

5.2.2 Composition and Layout Design: Page Structure, Typography, and Graphic Strategies 245

5.2.2 (a) Page Anatomy and Structural Components 245

5.2.2 (b) Grid System 245

5.2.2 (c) Typographic Palette: Type Style and Paragraph Alignments 247

5.2.2 (d) Graphics Strategies 248

5.2.3 Layout Styles and Fundamentals of Page Layout Principles 250

5.2.3 Part A: Organization of Information in the Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Books 250

5.2.3 Part B: Layout Styles and Fundamentals of Page Layout Principles 254

5.3 Limitations of the Present Study 257

5.4 Implications of the Findings 258

5.5 Recommendations 259

5.5.1 Future Research Scope: 259

5.5.2 Future Action/Policy: 259
5.6 Contribution to Research 259
5.7 Autobiographical reflection 259
5.8 Conclusions 260

Appendix

Appendix A : Digitization of the Seventeenth Century Devanagari Brahmanical Script 267
Appendix B : Post-17th Century Devanagari Brahmanical Manuscripts 270
Appendix C : Overview of the Distinctive Design Features of the Manuscripts from Other Cultures 275

References

..... 284

Abbreviations

BISM	-	Bharat Itihas Samshodhak Mandal
BORI	-	Bhandarkar Oriental Research Institute
BL	-	British Library
DC	-	Deccan College of Postgraduate and Research Institute
NMND	-	National Museum, New Delhi
SVM	-	Samartha Vagdevata Mandir
VSM	-	Vedic Samshodhan Mandal
VMHK	-	Victoria Memorial Hall, Kolkata
VAM	-	Victoria and Albert Museum, London

List of Figures and Tables

List of Figures

Figure 1. 1: The word 'Design' (*Rachana*) in Vedic Literature ‘Brahma Sutras’ (Badarayana, 1999, p. 189) 2

Figure 1.2: Mehergarh Pottery, (Soudip, 2014)....3

Figure 1.3: Harappa Seal — A graphic art which includes juxtaposed text and illustration, (Midnight's Children Resources)....3

Figure 1.4: Brahmi Script on Ashoka Pillar at Sarnath, Courtsey: https://en.wikipedia.org/wiki/Brahmi_script....3

Figure 1.5: Decorative Motifs and Patterns, Cultural Designs, Maharashtra 4

Figure 2.1: Various Elements of Devanagari Script (Naik, 1965, p. 214)....16

Figure 2.2: *Bamboo* Pen (Naik, 1965, p. 214) 16

Figure 2.3: Writing Sequence of Devanagari script with different units to form a character ‘अ’ (Gokhale, Design Parameters of Devanagari, 1983). 17

Figure 2.4: Minute Anatomy — Details of Devanagari Letterform, (Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008, p. 47) 17

Figure 2.5: Devanagari Letterforms with Writing Sequence (Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008, p. 51)....18

Figure 2.6: Rekhapati —.Front and back side with woven thread and ruled lines on paper. Courtsey -Vedic Samshodhan Mandal, Pune. 21

Figure 2.7: New manuscript Inscribed by the Stylus. Tip of the stylus made of metal and body is made of wood. Lanna manuscripts. (EFEO Bangkok Centre) 22

Figure 2. 8: Ink-pots, Source: Private publication ‘Dipping into the Glorious Past’, Raja Dinkar Kelkar Museum, Pune 23

Figure 2.10: Gutka Manuscript, a small book of hymns from the Guru Granth Sahib, Dr. Gurpal Singh Bhuller collection, (SikhMuseum.com, 2013) 25

Figure 2.11: Opening and Closing Page with Floral Decoration, (*Jnātadharma-kathā* (*Prakrit* d. 4), 2016). Courtesy: Bodleian Libraries, University of Oxford....26

Figure 2.12: Colophon Written with Red Colour Ink, Paper Manuscript Courtesy- National Mission for Manuscript, India 27

Figure 2.13: Column Grid, *Astasahasrika Prajnaparamita Sutra* - Indian palm leaf manuscript written in the 11th century (Henss, 2007) 27

Figure 2.14: Illustrations placed within Hierarchical Grid - *Uttaradhyayanasutra*; Kapila(Museum and the Victoria & Albert Museum', British Library and Institute of Jainology, 2006). © Victoria Albert Museum, London 28

Figure 2.15: 'Mewar Ramayan' Work commissioned by Maharaja Jagat Singh. (Online Gallery, Virtual Books, Mewar Ramayan:The British Library) 30

Figure 2.16: Development of Devanagari Script, (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 274) 31

Figure 2.17: Elegance of Script, described in *Lipisaushthav* (Prasad, 2007; Satyendra, 1978, p. 85) 32

Figure 2.18: *Geeta Govinda*, Early Bengali language, 18th century (Museumsofindia) 33

Figure 2.19: Islamic Manuscripts with Decorative Patterns on Borders, (Islamic Manuscript Network) 34

Figure 2.20: Palm Leaf Manuscript with Illuminated Cover Page (Photo Gallery - Palm Leaf, 2016), Courtesy: National Mission for Manuscripts, India 35

Figure 2.21: A Jaina Manuscript with Decorative Motifs, *Uttaradhyayana Sutra*, (*Uttaradhyayana Sutra*, Mahavira preaching). © British Library 36

Figure 2.22: *Rigveda Sukta* with Diacritic Marks 37

Figure 2.23: Systematic demonstration of Villard de Honnecourt Grid, 13th Century (Haslam, 2006, p. 44) 42

Figure 2.24: Page Division Using Geometric Construction. Villard de Honnecourt Grid (Haslam, 2006, p. 45) 42

Figure 2.25: Components of a Page (Haslam, 2006, p. 20) 54

Figure 2.26: Grid and Composition of Text and Images.(Stribley, 20 Design Rules You Should Never Break, 2015). 56

Figure 2.27: Text Composition using Baseline Grid (Quills and Pixels). 56

Figure 2.28: Various Grids Types (1-7) — Visual Representation, Modern Publication Designs. (Tondreau, Layout Essentials, 2009, p. 11), (Haslam, 2006, p. 56) 57

Figure 2.29: Various Grid Types (A, B, C) and Representative Sample Layouts 58

Figure 2.30: Example of Centralized Layouts of spreads 60

Figure 2.31: Typography and Visual Hierarchy (Indesign Tutorial #3 – Interview Article, 2010) ..63

Figure 2.32: White Space in Layout (rafaelhdesigns) 66

Figure 4. 1: ❶ Indian Reader - (People of India, 2014) ❷ Indian Writer - A Commemorative Postage Stamp on 'Panini' released by Indian Post Department, 2004 (Postage Stamp,2015) ...87

Figure 4.2: Landscape Format Seventeenth Century Devanagari Brahmanical Manuscript, BISM, *BhagvadGeeta Satkah*, 1696 AD 90

Figure 4.3: Portrait Format Seventeenth Century Devanagari Brahmanical Manuscript, SVM, *Kalyanpotha*, 17th Century AD 90

Figure 4.4: A0 Series - ISO Standard Paper with Various Subdivisions 91

Figure 4. 5: Digital Illustration showing Modern Publication Design Formats 91

Figure 4. 6: Portrait Format Representative Modern Publication Designs 91

Figure 4. 7: Landscape Format Representative, Modern Publication Designs 92

Figure 4. 8: Square Format Representative Modern Publication Designs 92

Figure 4.9: Pocket Size Portable Books - Landscape and Portrait Format, Modern Publication Design 92

Figure 4.10: Digital Illustration of Diagram showing ‘Turning a Folio’ of the Manuscript, Seventeenth Century Devanagari Brahmanical Manuscripts 94

Figure 4. 11: Graphical Visual Representation of Page-turning Scenarios (1, 2, 3), Text flow, and Eye Movement Direction, Seventeenth Century Devanagari Brahmanical Manuscripts 95

Figure 4.12: Digital Illustration - Top Side (Type A) and Left Side Binding (Type B) Methods and Page Turning Systems, Modern Publication Design 96

Figure 4.13: Text Writing Pattern of the Seventeenth Century Devanagari Brahmanical Manuscripts, ...97

Figure 4.14: Orientation of the Text and Text Direction on Front (1) and Back Sides (2) of Manuscript Folio, Seventeenth Century Devanagari Brahmanical Manuscripts 97

Figure 4.15: Top Side Book Binding (Group 1) - Red Arrow indicates Text Flow Direction, Modern Publication Design 99

Figure 4.16: Left Side Book Binding - (Group 2) Red Arrow indicates Text Flow Direction, Modern Publication Design.....99

Figure 4.17: Left Side Book Binding (Multiple Columns) (Group 3) - Red Arrow indicates Text Flow Direction, Modern Publication Design.....100

Figure 4.18: A Digital Illustration of Imposition and Binding - Manuscript with Single Page on One Side.....101

Figure 4.19: A Digital Illustration of the Manuscript with Double Spread with Paper Size and, Imposition of Pages on Front and Back Sides of Folios 101

Figure 4.20: Imposition of Pages on Folded Sheets with 'Signature': Modern Book 102

Figure 4.21: Demonstration of Page Imposition for Double Spread Type of book with Binding on Left Side, Modern Publication Design, *Thaipatra* 103

Figure 4.22: Demonstration of Page Imposition for Double Spread Type of book with Binding on Top Side, Modern Publication Design, *Shree Hanuman Chalisa* 104

Figure 4.23: Book Binding Techniques, Modern Publication Design.....104

Figure 4. 24: Basic Structural Components of the Folio with Digital Illustration - Seventeenth Century Devanagari Brahmanical Manuscripts.....114

Figure 4.25: Page Anatomy of Single Columns Page Layout, Digital Illustration, Modern Publication Design 115

Figure 4.26: Page Anatomy — Multiple Columns and Mirror Image type Page Layout, Digital Illustration, Modern Publication Design 115

Figure 4.27: Digital Illustration — Grid Construction of a Single Folio Text Oriented Manuscript 117

Figure 4.28: Typography, Headline Grid, and Formation of Leading Space (Type 1), Seventeenth Century Devanagari Brahmanical Manuscripts.....118

Figure 4.29: Typography, Headline Grid, and Formation of Leading Space (Type 2), Seventeenth Century Devanagari Brahmanical Manuscripts.....118

Figure 4.30: A Digital Illustration of Manuscript with Double Spread Paper Size and, and Imposition of Pages on Front and Back Side of Folio.....120

Figure 4.31: Digital Illustration and Manuscript of Modular Grid Formation 121

Figure 4.32: Digital Illustration showing Defined Area for Margin and Text block on Manuscript Page.....121

Figure 4.33: Digital Illustration of Boundary Lines on the Left and the Right Margin.....122

Figure 4.34: Digital Illustration - Grid Deconstruction with Defined Margins, Headline Grid, Page Navigation System and, Image Area.....122

Figure 4.35: Digital Illustration showing Superimposition of Grid Structure, and Manuscript Page 122

Figure 4.36: Digital Illustration of Grid Construction of a Manuscript with a '*Tripatha'* Page Layout 124

Figure 4.37: Digital Illustration - A Page Layout Template Design for a Manuscript with '*Tripatha'* style 124

Figure 4.38: Digital Illustration - A Grid Construction of a Manuscript with a Portrait Format Page Layout - Poetry Form 125

Figure 4.39: Digital Illustration - A Page Layout Template Design of Portrait Format Manuscript (Poetry Form) 126

Figure 4.40: Digital Illustration of Grid Construction of a Manuscript with a Portrait Format Page Layout with Horizontal Ruling (Step 1-3) 127

Figure 4.41: Digital Illustration of Grid Construction and Template Design of a Manuscript with a Portrait Format Page Layout with Horizontal Ruling (Step 4-5) 128

Figure 4.42: A Single Column Page Layout with Portrai Format - Digital Illustration of Deconstruction (Type 1: Step 1-3), Modern Publication Design 130

Figure 4.43: Single Column Page Layout with Landscape Format - Digital Illustration of Deconstruction (Type 2: Step 1-3), Modern Publication Design 131

Figure 4.44: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3: Step 1-2), Modern Publication Design 132

Figure 4.45: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3:Step 3-4), Modern Publication Design 133

Figure 4.46: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3), Final Layout, Modern Publication Design 133

Figure 4.47: Multiple Column Modular Grid Page Layout - Digital Illustration of Deconstruction (Type 4:Step 1-5), Modern Publication Design 134

Figure 4.48: Multiple Column Grid Page Layout - Digital Illustration of Deconstruction (Type 5), Modern Publication Design.....135

Figure 4.49: Multiple Column Grid Page Layout - Digital Illustration of Deconstruction (Type 6, Modern Publication Design.....135

Figure 4.50: Multiple Column Asymmetrical Grid Page Layout - Digital Illustration of Deconstruction (Type 7), Modern Publication Design.....135

Figure 4.51: A Mix Grid Page Layout - Digital Illustration of Deconstruction (Type 8), Modern Publication Design 136

Figure 4.52: A Grid Construction of a Hierarchical Grid Page Layout - Digital Illustration of Deconstruction (Type 9), Modern Publication Design.....136

Figure 4.53: A Grid Construction of a Golden Ratio Grid Page Layout - Digital Illustration of Deconstruction (Type 10), Modern Publication Design.....136

Figure 4.54: Use of Multiple Typestyles in Single Page Layout Designs, (Type 1-6) Modern Publication design - (Narale, Sanskrit Primer), (Pangarkar, 1990), (Family Doctor, 2016), (Saptahik Sakal, 2016), Sakal Publishers Pvt. Ltd., 2016, ...144

Figure 4.55: Basic Text Alignments in Modern Graphic Designs, (Type 1-4) Modern Publication design 145

Figure 4.56: Combination of Multiple Text Alignments in Layout Composition, Modern Graphic Designs, (Pangarkar, 1990) 145

Figure 4.57: Combination of Multiple Text Alignments in Layout Composition, Modern Graphic Designs, (Lokapala Raja Sayajirao, 2013) 146

Figure 4.58: Deconstruction of Manuscript and Layout Composition Patterns - Space Organization for Small Size Illustrations, Seventeenth Century Devanagari Brahmanical Manuscripts 151

Figure 4.59: Deconstruction of Manuscript and Layout Composition Patterns - Space Organization for Text and Illustration, Seventeenth Century Devanagari Brahmanical Manuscripts.....153

Figure 4.60: Images and Illustrations in Cover Page Designs (Type 1, 2 & 3) - Modern Publication Design. (Hemenway, 2006),.....154

Figure 4.61: Visuals in Section Separators (Type 1 & 2) - Modern Publication Design, Woodworker's (Self, 2005),.....155

Figure 4.62: Visuals in Chapter Opening Pages (Type 1, 2, 3, 4) - Modern Publication Design....155

Figure 4. 63: Illustration Showing End of Chapter - Modern Publication Design (Pangarkar, 1990) 156

Figure 4.64: Images as the Background of the Text, Pages - Modern Publication Design,.....156

Figure 4.65: Information Graphics and Tables - Modern Publication Design, Woodworker's (Self, 2005), ...157

Figure 4.66: Text Wrapping around Visuals - Modern Publication Design, (Benson, 2009),.....157

Figure 4.67: Visual Magnitude on the Page - Modern Publication Design, (Pattnaik, 2006).....158

Figure 4.68: Visuals Placement within Columns - Modern Publication Design, (Andrews, 2006) 158

Figure 4.69: Visuals Placement within Modular Grid - Modern Publication Design,.....159

Figure 4.70: Building Blocks of Grid - Columns and Units, Modern Publication Design 168

Figure 4.71: Hierarchical grid in Modern Publication Design, (Pangarkar, 1990).....171

Figure 4.72: Hierarchical grid with *Tripatha* page layout, Seventeenth Century Devanagari Brahmanical Manuscripts, *Ragavibod*, 1618 AD.....171

Figure 4.73: Approach of Scribe and Artist in writing and drawing content using manuscript template - Seventeenth Century Devanagari Brahmanical Manuscripts 179

Figure 4.74: Padding around Visual in Modern Publication Design, Sakal Saptahika, Sakal Publishers Pvt. Ltd., 2016 181

Figure 4.75: Various Possible Segments of the Seventeenth Century Devanagari Brahmanical Manuscripts 187

Figure 4.76: Various Possible Segments of the Modern Publication Design 189

Figure 4.77: Text Based Layout with Single Text, (Category - Only Text 1), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts 191

Figure 4.78: Text Based Layout with Single Text (Category - Only Text 2), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts 192

Figure 4.79: Text Based Layout with Single Text (Category - Only Text 3), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts 193

Figure 4.80: Text Based Layout with Single Text (Category - Only Text 4), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts 194

Figure 4.81: Layout Editorial Style - Bilingual Continuous Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts.....195

Figure 4.82: Layout Editorial Style - Commentary (*Sanskrit & Sanskrit*) *'Tripatha'* Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts.....196

Figure 4.83: Layout Editorial Style - Bilingual (*Sanskrit & Hindi*) '*Tripatha'* Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts 198

Figure 4.84: Text Based Layout with Single Text (Category - 1), Landscape Format- Modern Publication Design 200

Figure 4.85: Text Based Layout with Single Text (Category - 2), Portrait Format, Modern Publication Design 201

Figure 4.86: A Section - Multiple Text and Image Based Editorial Layout with Single Text (Category - 3), Portrait Format - Modern Publication Design 202

Figure 4.87: Layout Editorial Style - Bilingual (*Hindi* & *Marathi*), (Category - 1), Portrait Format - Modern Publication Design 203

Figure 4.88: Layout Editorial Style - Bilingual (*Sanskrit* & *Hindi*), (Category - 2), Portrait Format - Modern Publication Design 204

Figure 4.89: Layout Editorial Style - Bilingual (Thai & English), (Category - 3), Portrait Format - Modern Publication Design 205

Figure 4.90: Layout Editorial Style - Bilingual (*Hindi* & *Marathi*) (Category - 4), Portrait Format - Modern Publication Design 206

Figure 4.91: Layout Editorial Style - Appropriation in Page Layout (Type 1 to 4), Modern Publication Design 207

Figure 4.92: Representative Samples showing Variety in Placement of a Running Title and a Folio number, Seventeenth Century Devanagari Brahmanical Manuscripts 208

Figure 4.93: Page Navigation System - Table of Content (Part 1-3), Index Entry (Part 4), Modern Publication Designs 209

Figure 4. 94: Page Navigation System placed in the Footer Area (Bottom Margin Area), Modern Publication Designs 210

Figure 4. 95: Page Navigation System placed in the Header - Footer Area, Modern Publication Design 210

Figure 4.96: Page Navigation System placed in the Left and the Right Margin Area along with the Graphic Elements , Modern Publication Design 211

Figure 4. 97: Chapter Opening Pages - Entry Point, (Type 1-4) Simple to Complex Page Layouts, Modern Publication Designs 214

Figure 4. 98: Type 1 & 5 - Entire Text is written in Black Colour with no Variation in Type Size - Seventeenth Century Devanagari Brahmanical Manuscripts, *Kundamartanda*, DC, 1691 AD216

Figure 4.99: Type 2 - Entire Text written in Black Colour with Variation in Type Size - Seventeenth Century Devanagari Brahmanical Manuscripts, *BhagvadGeeta Satikah*, BISM, 1696 AD 217

Figure 4.100: Type 3 - Text is written in two colours - black and red with variation in text size, Seventeenth Century Devanagari Brahmanical Manuscripts, *Vruddhachanakya*, Anandashram, 1694 AD 218

Figure 4. 101: Type 4 - Text is written in Two Colours - Black and Red color with variation in text size, Seventeenth Century Devanagari Brahmanical Manuscripts, *BhagavataPurana*, BORI, 1648 AD 219

Figure 4.102: Typography and White Space (Type 1 & 2), Landscape Format Seventeenth Century Devanagari Brahmanical Manuscripts 220

Figure 4.103: Typography and White Space (Type 3 & 4), Portrait Format Seventeenth Century Devanagari Brahmanical Manuscripts 221

Figure 4.104: Typography, Visual Hierarchy, White Space and Single Colour (Type 1- Category 1-4)) - Modern Publication Design.....223

Figure 4.105: Typography, Visual Hierarchy, White Space and Two Colour Page Layouts (Type 2) - Modern Publication Design 225

Figure 4.106: Typography, Visual Hierarchy, White Space and Multicolor Page Layouts (Type 3) - Modern Publication Design.....226

Appendix A 1: Patanjali Mahabhasya, Original Manuscript, 1653 AD, DC..... 264

Appendix A 2: Cleaning and sharpening of image by adjusting the sharpness and contrast using Adobe Photoshop 265

Appendix A 3: Guidelines to draw Devanagari Letterforms 266

Appendix C 1: *Dynatadharmakathangasutra*, BORI, 1568 AD 272

Appendix C 2: *Prajnyapanasutra*, BORI, 1493 AD..... 272

Appendix C 3: *Jeevabhigamsutra*, BORI, 1500 AD 273

Appendix C 4: *Tripatha* Layout Style, *Prajnaparamitasutra Tikasahita*, BORI 273

Appendix C 5: *Panchapatha* Layout Style, *Samavayangatika*, BORI, 1493 AD 273

Appendix C 6 : Visual Hierarchy in Text, *Sangrahami Sutra*, Salar Jung Museum, Hyderabad, 1700 AD 273

Appendix C 7 : Highly illustrative Jain Manuscript of *Kalpasutra*, VAM, Early 16th Century 274
Appendix C 8 : *Dah Pand-i-Hakim Aristo* [A Book on Good Counsels], VMHK..... 274
Appendix C 9: *Ain-i-Akbari*, www.museumsofindia.gov.in, VMHK 274
Appendix C 10: *Anvar-i Suhayli by Kashifi* , BL, MS 18579, 1504-5 AD..... 275
Appendix C 11 (A): *Jahangir Nama*, www.museumsofindia.gov.in, NMND, Early 17th century AD 275
Appendix C 12: Leather Binding, Anvar-i Suhayli, BL, MS 18579, 1504-5 A.D 276
Appendix C 13: Stowe MS 5, British Library www.bl.uk/catalogues/ illuminatedmanuscripts/reuse.asp 276
Appendix C 14: A 'Cadel' - calligraphic decorative letters (Illuminated Manuscripts, Glossaries), BL, 3rd quarter of 15th Century 277
Appendix C 15: French Manuscripts with Calligraphic text, crayon ruling and ornamented text frame, Courtesy: British Library 277
Appendix C 16 : Enlarged decorated initials, (Illuminated Manuscripts, Glossaries) BL. 278
Appendix C 17: 17th century content catalogue of Greek manuscripts in Latin and Greek, MS 22039, BL 279
Appendix C 18 : Golden Hagadah - Hebrew manuscript 14th-17th century, BL..... 279
Appendix C 19 : Van de Graff grid, Hebrew manuscript, 14th-17th century, BL 279
Appendix C 20 : Geometrical division of space - 9 x 9 grid, Hebrew manuscript, 14th-17th century, BL 280
Appendix C 21: Baseline grid, Hebrew manuscript, 14th-17th century, BL..... 280
Appendix C 22: Illumination of text, Hebrew manuscript, 14th-17th century, BL..... 280

List of Tables

Table 2.1: Conceptual Framework for Literature Review & Research Work 13
Table 2.2: Etymology of Graphic and Design 47
Table 2.3: Semiotic method to understand Visual Code of Graphic Design by Robert Craig(Craig, 1990, pp. 18-27) 51

Table 3. 1: List of Repositories for Manuscripts Collections in Maharashtra 83
Table 3. 2: List of the Seventeenth Century Devanagari Manuscripts at Various Libraries.....84
Table 4.1: Statistics : Manuscripts and Their Page Orientation.....89
Table 4. 2: Recorded Manuscript Size Range.....90
Table 4. 3: Area Occupied by Flipped Folios (Landscape Format).....107
Table 4. 4: Area Occupied by Flipped Folios (Portrait Format).....107
Table 4. 5: Details of Representative Modern Books for Layout Grid Study.....129
Table 4.6: Type Styles of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts.....139
Table 4.7: Specimens of Text alignments of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts.....142
Table 4.8: Seventeenth Century Devanagari Brahmanical Manuscripts - Page Layout Compositions with Illustrations and Text.....148
Table 4. 9: Representative Manuscripts details — Physical Parts.....187
Table 4.10: Chapter Opening Patterns of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts.....213

Abstract

Background

This thesis is an attempt to study a cultural visual communication through the interdisciplinary research, which involves the fields: ‘Graphic Design’ and ‘Indology’. An influence of culture is evident in the every visual art and design of a specific region. This thesis primarily investigates the design concepts employed in the composition of page layouts designed in the seventeenth century handwritten Devanagari Brahmanical manuscripts. Since it is a form of communicative visual design, their design concepts compared with the design principles practiced in the contemporary publication design, a specialized are of the graphic design.

Purpose

The focus of this research will be on the under-researched area of history of graphic design in the seventeenth century India, before the printing revolution began in the India. The aim of the research is to investigate distinctive systems, styles, and patterns in manuscript designs; to explore various editorial styles; to uncover the design principles employed in it; and too explore influence of other cultural designs on the manuscript design

Method

Due to the limitations of huge of a number of manuscripts spread across the country, the scope is narrowed down to the area i.e. Maharashtra, the state within India. Manuscripts collected from repositories and selected few as representative samples. The qualitative analysis conducted following three major heads of graphic design principles for comparison purpose with the help of representative publication designs. These three heads are: form and function, an organization of information and layout styles, and fundamentals of page layout principles. A digital deconstruction method employed in the visual representation of analysis.

Conclusions

The findings of this qualitative and explorative study discovered many queries aroused previously. The form, format, page turning system, text flow and reading directions, utilization of layout editorial styles found similarities in both the manuscripts and the modern publication designs. Depending on the size of manuscripts, various nomenclatures are assigned.

The critical analysis has strongly put forward the practice of template design process in manuscript, which is similar to the modern publication designs. Skillful organization of space controlled with the grid system for defining margin area, text block area with headline grid, page navigation system, and graphics strategies. Various editorial styles employed strategically in the page layout designs of single and multilingual manuscripts. This study brings to the light 'geometrical nature' of the manuscript.

Many manuscripts followed conventional design method, with landscape page-layout format but few experimental designs are exceptionally different from the conventional ones. Their features include portrait format structure; no margin border rules; full-page illustration style without a border; and text arranged in vertical modular grid structure forming visual groups of stanzas.

A predominant use of the rhetoric style '*anubandha chatushtya*' is to represent orderly information related to the manuscript and the three types of colophon support the 'logical system' of the manuscripts.

Manuscript designers' have followed their contemporary literature to design manuscripts. Hence, according to the literature in many of the manuscripts consistency in calligraphic attributes and styles maintained throughout the manuscripts. In mid and later period of the seventeenth-century the variation in calligraphic attributes are noticeable.

As the manuscripts grid system is deficient with columns and gutter space as in the modern publication design, drawback noticed in the area of graphic strategies, which resulted in the untidy look. The minimalistic and simplistic approach in design practiced due to the traditional, aesthetic, cultural, habitual and functional demand.

Although many findings are compatible with the design concepts of the seventeenth century Devanagari Brahmanical manuscripts and the modern publications designs, they differ from

in several areas. Manuscript page layouts deficient in columns, pages with spreads (recto and verso), asymmetrical balance in the layout, stitching or gluing type of binding systems as provided in modern publication designs.

Limited and controlled use of colour palette, standardization of colour, and the introduction of white space have highlighted or distinguished different type of information in visual groups. Formal balance is easily noticeable in the layout with the justified text alignments. Following principles of design traced in the manuscripts, they are: consistency, repetition, proportion, scale, contrast, harmony, balance, visual hierarchy, emphasis, order, tension, along with the elements such as line, colour, white space, etc. They resulted in creating an interest in the pages by pulling up the visual hierarchy, visual order, a grouping of information, etc.

Application of design principles in the seventeenth century Devanagari Brahmanical manuscript added the effectiveness and efficiency while reading the manuscripts. These conceptual designs are aesthetically simple and easy to comprehend and encompass the user-centered utilitarian approach and functional value. Therefore, they are accepted in modern publication design with few adaptations to fulfill the cultural, traditional and linguistic demand of the focused group.

Keywords

Graphic Design, Publication Design, Indian History of Design, Indology, Layout & Composition Design, Design Principles

Chapter 1

Introduction

1.1 Introduction

This is an interdisciplinary research, which comprises ‘Graphic Design’ and ‘Indology’. Graphic design is a powerful medium to communicate a message visually, and Indology is the study of Indian Art & Architecture, Epigraphy, Numismatics, Archaeology, Literature, etc. There is always a remarkable influence of culture discernible in visual art and design.

This study primarily investigates the design concepts employed in the composition of page layouts of the seventeenth century handwritten Devanagari Brahmanical manuscripts. Here the focus is exclusively on comprehending the design process employed in creating the handwritten manuscripts.

The principal aim of this research is to understand the graphic design ideologies of Indian manuscript designers, especially in comparison with the publication design — a specialized area of the graphic design.

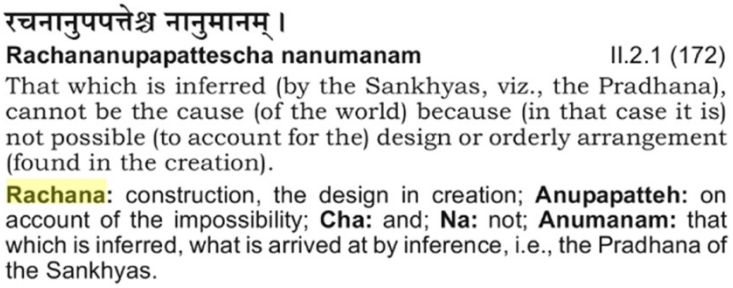
The secondary aim of this research is to give a voice to the silent design history of the Devanagari Brahmanical manuscript as a graphic visual communication.

This study is planned to accomplish the history of publication design and its design concepts, patterns, distinctive editorial styles, application of fundamental design principles practiced in India prior to the printing technological revolution, which began in the eighteenth century in India. It will also encompass the form and function of the manuscripts, grid structure, template making process, graphic strategies, and a peculiarity in the design. It also deals with the minimalistic and simplistic approach in the page layout design.

1.2 Background / Cultural and Historical Relevance of Design Concepts in India

Every culture has tangible and intangible cultural heritage represented through various mediums. Tangible is a physical property of culture, which includes building, monuments, books, artworks, artifacts and the work of arts. Representing the tangible aspects of culture in visual art forms are one of the popular medium using different types of tools and materials. Books are considered as the tangible movable cultural property of every civilization, they used to document cultural history (Intangible Cultural Heritage, 2016).

The Vedic literature of India advocates systematic, organized, and orderly process of work execution. The practice of this approach dates back to the Vedic period. This concept of planned composition is found typically applied in any graphic design project. In the Indian context, the word 'design' is introduced through Vedic literature. In *'Brahma Sutras'* the word ***'Rachana'*** is introduced, and it means either construction or composition or for that matter orderly arrangement that is nothing but design (Badarayana, 1999, p. 189).



रचनानुपपत्तेश्च नानुमानम् ।

Rachananupapattescha nanumanam II.2.1 (172)

That which is inferred (by the Sankhyas, viz., the Pradhana), cannot be the cause (of the world) because (in that case it is) not possible (to account for the) design or orderly arrangement (found in the creation).

Rachana: construction, the design in creation; **Anupapatteh:** on account of the impossibility; **Cha:** and; **Na:** not; **Anumanam:** that which is inferred, what is arrived at by inference, i.e., the Pradhana of the Sankhyas.

Figure 1. 1: The word 'Design' (*Rachana*) in the Vedic Literature '*Brahma Sutras'* (Badarayana, 1999, p. 189)

The *'Aghamarshanam'* hymn, in the tenth chapter of the *Rigveda,* described the systematic creation of the universe, and the word *'Kalpa'* is used to denote this process (Subramanian, 2013).

Kak has taken an overview of the evolution of early writing in India and he has found that cultural traditions in India began with Indus-Sarasvati valley civilization in about 5000 B.C. Mehrgarh is one among more than 2500 sites of this civilization. The writing was in practice during the period of Harappan civilization 2600-1900 B.C. It was the first urban civilization, and the script used was called 'Indus script'. After the decline of Harappan civilization, the second urbanization emerged in *Ganga-Yamuna* valley around 900 B.C. Some of the records available of this civilization are in *Brahmi* script. The

pictorial marks/symbols are found punched by traders on silver coins. Kings started issuing their punch-marked coin by the sixth century B.C. (Kak, 1994, pp. 375-376)

According to Jane, the potteries found at Indus civilization sites in the western Punjab have typical forms and they are decorated with polychrome designs, geometric patterns, and motifs (McIntosh, 2008, p. 68)



Figure 1.2: Mehergarh Pottery, (Soudip, 2014)

While expressing thoughts on the early development of art, symbol and technology in Indus Valley civilization Meadow observed that Harappan seals have a unique style and have a mysterious script. The seals were inscribed with objects and the technique for taking impression was intaglio (Richard H. Meadow, 2016).



Figure 1.3: Harappa Seal — A graphic art which includes juxtaposed text and illustration, (Midnight's Children Resources)

Evidence of Indian writing traditions are available today in various forms such as Harappan seals dates back to 3000 years; Ashok's inscriptions in 3rd century B.C.; Eran coin found in Jabalpur earlier to 4th Century B.C.; Piprahawa Vase Inscription – 5th century B.C.; and Sohagaura Copper Plate – 2nd half of 4th Century B.C. (Murthy R. S., 1996, pp. 2,3).

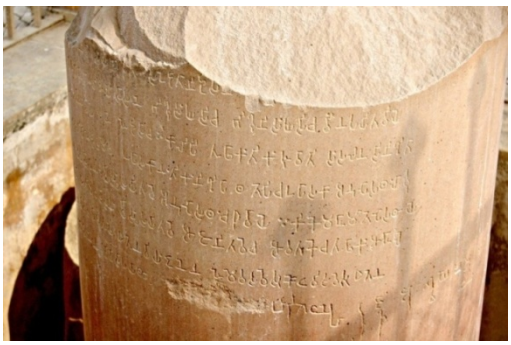


Figure 1.4: Brahmi Script on Ashokan Pillar at Sarnath, Courtsey: https://en.wikipedia.org/wiki/Brahmi_script

Most of the Indian traditional forms are highly decorative and inspired by nature. Basic forms and are exaggerated by stylizing, adding intricacy and inclusion of flow and rhythm into line (Betala, 2005, p. 111).

Ellora Caves, Aurangabad
6th - 11th Century AD

Kopeshwar Temple, Kolhapur
12th Century AD

Kukdeshwar Temple, Junnar
12th Century AD

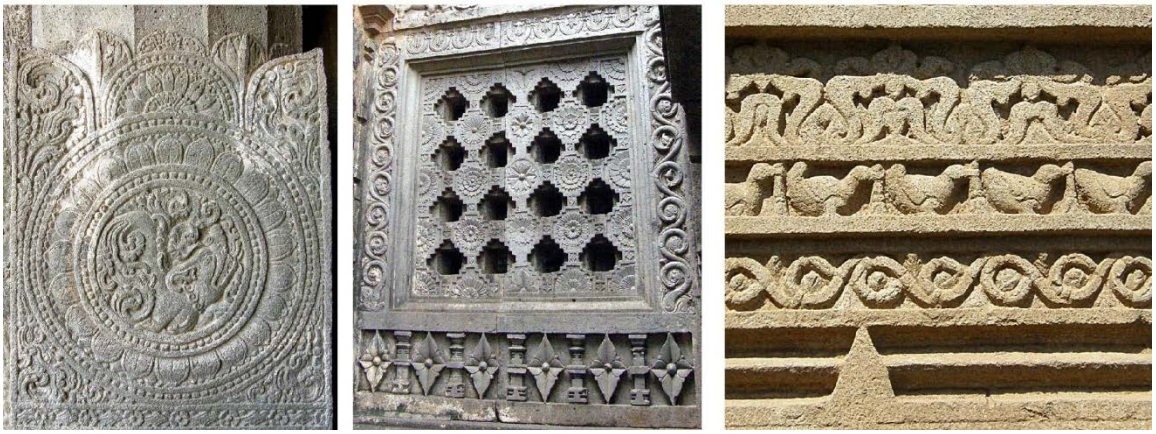


Figure 1.5: Decorative Motifs, Patterns, and Socio-Cultural Designs, Maharashtra

Incorporation of graphic art in various forms and the medium is noticeable in a day to day socio-religious activities in Maharashtra. According to Tadvalalkar, the symbol is a presentation of the culture and they transcend history. Maharashtra has a great tradition of graphic art i.e. '*Rangoli'*. *Rangoli* portrays symbolism to present themes such as fertility, cosmic forces, regeneration, etc. Geometrical patterns made up with dotted grid and connecting dots with lines are part of the traditional style. Shapes are made out of them are filled with suitable colours. For every occasion a specific form of Rangoli is drawn e.g. *Chaitrangan* in the month of *Chaitra; Bhondal* or *Hadga* during *Dasara* festival; *Bodan, Vasurbaras, Rathsaptami. Rangolis* have made up of auspicious symbols like *Gopadma, Swastika, Chakra, Shankha,* Lotus, *Tulsi Vrindavan,* etc. along with calligraphic note "*Shree Ram Prasanna*", "*Shree Ganesh Prasanna*" (Tadvalkar, 2012).

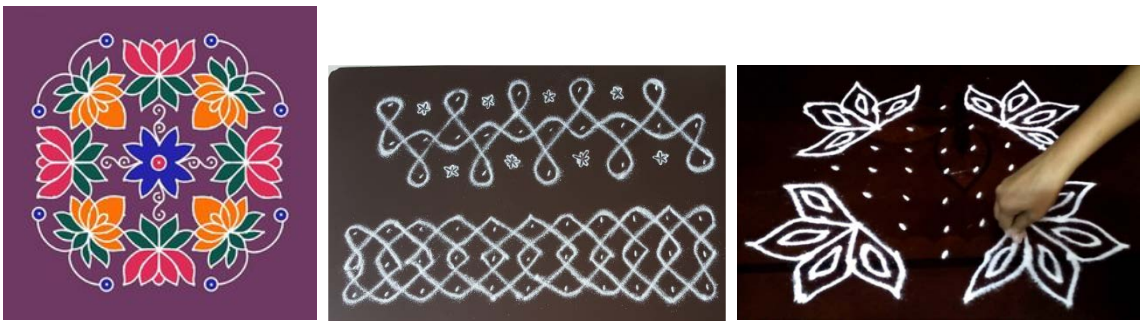


Figure 1.6: Structured, Rhythmic, Floral, *Rangoli* Patterns using Grid

All these observations formulated a question in researcher's mind that while all these socio-cultural-religious design patterns were existing in their surroundings as inspirational designs, then why the seventeenth century Devanagari Brahmanical manuscript designer did not use these patterns in their page layout designs? However, there were many other design elements noticed which are commonly found in the modern publication designs.

In the light of above discussions, the researcher has noticed ample scope in the area related to the composition and layout design in the seventeenth century Devanagari Brahmanical manuscripts, which might be of some value in the field of history graphic design.

1.3 Need of Research

Many academician and scholars of India raised a concern related to the study of Indian art with the perspective of history. Prof. R. K. Joshi has suggested to explore areas in the field of manuscriptology. These areas are calligraphy and the formal study of the manuscripts. They include the structural analysis of the manuscript from the point of view of design perspective to know the styles and trends in the past, which are continued in the presents (Joshi, Calligraphic Study of Manuscripts, 1983, p. 13).

According to Prof. Vyas, knowing the history of design helps in understanding the significant development in design theory and lateral processes. It is a boundary between the tradition and the novelty (Vyas, Design The Indian Context, Learning the Historical Rationale of the Indian Design Idiom, 2000, pp. 6, 13).

Kalman, an American graphic designer (1949-1999) expressed his thoughts over design history. According to him, "Design historians construct a lens through which they view design. This lens is selective: It zooms in on a subject and blocks peripheral vision. What

we see is a narrow segment of design history; one period, one class of designers within that period. What we don't see is the context, both within the design profession and within social history". Kalman further states, "Good design history acts as a catalyst for our own ideas. Good design history says, this is how designers thought about their work then, and this is how that work fits into the culture." (Print magazine, 1991).

Considering the manuscript as an example of visual communication that was influenced by the social, political, and economic environment of a time and place, it is a representation of ideas and a culture. To understand the socio-cultural design history and Indian design aspects, there is a need to study of manuscript design prior to technology based printing revolution started across the country (India).

1.4 Purpose of the Study: Problem and Significance

Manuscriptology, as a specialized area in the field of Indian cultural history, many experts recorded their observations related to various aspects. These areas mainly concern with the linguistics, medicine, literature, cataloguing and preservation methods, etc.

Most scholars have worked in the various areas related to Indian manuscriptology. The areas of study are mainly: subjects dealt (Velankar, 1998); medium of writing, tools and instruments, sizes and forms (Murthy R. S., 1996); schematic structure and composition styles of Jaina manuscripts (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg, 1975); elements on page such as page number, marginalia, abbreviations, segmentation of chapters, etc. (Punyavijay, 1938); various painting styles; content or knowledge area of manuscripts; calligraphic features etc. Recently a few scholars have worked in the areas such as the calligraphic style of the Jaina manuscripts (Naik & Dalvi).

However, there has been no research being undertaken, which specifically deals with the design aspect in the making of the Devanagari Brahmanical manuscripts of the seventeenth century and its equivalence with the modern publication design process. Previous work has not specifically addressed the functional, user-friendly, utility-oriented and aesthetics facets of the manuscripts.

The focus of this research is on the under-researched area of history of graphic design in the seventeenth century Devanagari Brahmanical manuscripts of Maharashtra.

This study will also reveal the history of publication design in India prior to printing technological revolution, which began in India in the eighteenth century. It will be fascinating to find out the similarities and differences in the page layout designs of the manuscripts and the modern publication design aspects.

1.5 Primary Research Questions

Indian manuscripts have always created interests in researchers' mind as this researcher has always found few common elements with the contemporary publication designs. Utilization of contemporary book design principles is easily noticeable in the manuscripts of India.

Geometrical motifs, *mandalas*, symbols, patterns, grids, and iconography are vital parts of Indian graphic design, which are seen in the temples, decorated walls of houses, in regular practice of religious rituals, and in drawing *rangoli* patterns and designs. Therefore, the researcher had a question in mind, why these designs were not employed in Devanagari Brahmanical Manuscripts for embellishment. Although these manuscript designs are aesthetically pleasing with simple and functional schematic structure, why there is absence of extravaganza decorative element? However, it is a very well noticed that many design aspects of manuscripts are similar with contemporary book designs. Therefore, the journey began to explore an undisclosed area of the study of composition and layout design knowledge of manuscript designers prior the printing technology introduced in India.

1.6 Hypothesis

The main hypothesis is that the seventeenth century Devanagari Brahmanical manuscripts designers followed design theories in the planning of handwritten manuscripts. The research aim is accomplished through other supportive hypothesis.

1.7 Research Design

This explorative research is broadly classified into two categories: the first, review of the literature; and the second, collection of primary and secondary data. In the literature review, secondary data collected by defining three broad categories related to the Devanagari script, manuscriptology, and the modern graphic design. Through the evidence collected from literature review the researcher could get a clear understanding related to the gap of knowledge and it guided to formulate research argument.

Due to the limitations of research (e.g. geographical limitations), the researcher selected institutes and repositories from Maharashtra state in India. She personally visited them to select and collect the primary data for the study. Since the sample size is very large in number, the researcher first undergone through the catalogues of repositories and then selected seventeenth-century manuscripts. Selective manuscripts further examined physically and a few of them with potential for the study selected as a purposive representative samples.

Digital photography and photocopy machines were used for collecting the samples.

There are many other types of Devanagari manuscripts available (e.g. Jaina), which are designed during the seventeenth century in India, they do demonstrate specific cultural aspects. The cultural aspects are repeatedly seen in their designs. They have a lot of potential for the study and hence separate investigative approach is applied for the study. Therefore, only Devanagari Brahmanical manuscripts of the seventeenth century are chosen for this critical study.

1.8 Conceptual Framework

To examine the representative manuscript, three thematic categories are defined. Based on the layout formats and distinctive graphic design features, the representative manuscripts were selected for the study; further, they are compared with modern book designs to understand similarities and differences in their design aspects.

The first theme is related to the ‘Form and Function — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Designs’. In this theme, the areas examined are related to the various page formats, page turning system, and its association with placements of turned pages, text flow without interruption and the ergonomic convenience in handling manuscript folios.

The second theme is concerned with ‘Composition and Layout Design — Seventeenth Century Devanagari Brahmanical Manuscript and Modern Publication Design’. This theme discusses the anatomy of the page, grid system, typographic palette — type style and paragraph alignments, and graphics strategies employed in the page layout designs.

The third theme deals with the ‘Layout Styles and Fundamentals of Page Layout Principles — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Design’. In this theme, representative samples are analyzed. The manuscripts

are studied to know their information organization strategy and cohesive and spatial arrangements of the content with respect to the graphic design principles.

To study all above-mentioned themes a graphical representation method adopted using the computer-aided digital illustrations to deconstruct and visualize the representative manuscript samples. It is a visual thinking technique with practice-based method (Gray and Malins, 2008, pp 103-107).

Findings of the study are compared with the various modern publication designs, in which graphic design fundamentals have been employed for the composition and layout designs.

Computer software e.g. Adobe Illustrator, CorelDraw, and Adobe Photoshop were put into use as assistive tools for deconstructed visual representation.

This explorative study will compare layouts under the various heads of layout design. This researcher strongly believes that the designers of the Devanagari Brahmanical manuscripts of the seventeenth century available in Maharashtra have knowledge of graphic design, and they have their own system and method of page layout design.

In the past thirty years, there has been a rapid growth in the area of graphic design with the invention of digital technology for the layout and composition design. It also includes the techniques with adding up of new utility and user-centric approach. Overview of selective fundamental principles of graphic design is taken into account to understand the application of design principles in the modern publication designs.

1.9 Scope and Limitations of Research

The major concern in this qualitative research was to select samples and determine the sample size. The manuscripts written in the seventeenth century are in huge numbers, around five lacks as estimated by National Manuscript Mission, India (Indian Manuscripts: What is Manuscript, 2007), and spread across India, which includes the state of Maharashtra.

The limitation of the study was that the researcher could not reach out to every manuscript because of the three reasons: The first limitation is geographical limitation; the second is that manuscripts are in the collection of many repositories, institutions, and in the personal collection; and the third is, the limitation of time and economical factors.

Therefore, the scope of the study was confined to the geographic limits. Finally, the Maharashtra region is chosen for the data collection and selected purposive representative samples for the study. Similarly, the large sample availability of the modern publication designs for the comparative analysis was found. Therefore, a selection of representative sample approach was followed in data collection of modern publication designs with various genres. Representative samples were collected depending on their functional, aesthetics, and utilitarian design aspects.



Figure 1.7: Political Map of India, 2016

1.10 Outline of the Thesis

This thesis is organized into following five chapters.

Chapter 1: Introduction

In the first chapter, the researcher has introduced briefly research work done so far. This chapter also argues the need and significance for the undertaking of this study.

Chapter 2: Literature Review

The second chapter outlines the review of the literature. The theoretical framework derived based on three categories and further, they are explored through variables for conducting a review of the literature. They are: a Devanagari script, practices of manuscriptology in India and abroad, and modern graphic design. Literature related to Indian manuscriptology is reviewed specifically in context with composition and layout design.

Chapter 3: Research Methodology

The third chapter discusses the research methodology adopted to study the representative samples.

Chapter 4: Data Analysis and Finding

The fourth chapter anlyses the data collected and presents the findings. Data analysis is conducted under three primary themes with several sub-topics related to graphic design. Findings of analysis along with the comparative analysis of the seventeenth century Devanagari Brahmanical manuscripts and modern publication design are presented in this chapter.

Chapter 5: Discussions and Conclusions

This chapter provides a broad outline of the findings of the content analyzed in the previous chapter. This chapter concludes the research work. It presents an overview of complete research work with recommendations, implication of research, and finally adds the scope of future work.

Appendix A

Digitization Process of the Seventeenth Century Devanagari Brahmanical Script

Appendix B

Post - 17th Century Devanagari Brahmanical Manuscripts

Appendix C

Overview of the Distinctive Design Features of the Manuscripts from other Cultural Traditions

References

This incorporates material referred by the researcher for the study.

Chapter 2

Literature Review

2.1 Introduction

This chapter discusses a research strategy that followed to review related literature. The researcher has followed 'Systematic Literature Review' method suggested by Transfield *et al*. (Transfield, Denyer, & Smart, 2003).

A thorough review of literature is undertaken. It is conducted with reference to existing related literature through journals, books, magazines, and online sources. The 'Systematic Literature Review' method has guided the researcher to develop a research model based on the theoretical framework and identifying building blocks for the research. Building blocks further fragmented into constructs and variables for the study. ‘Funnel method’ has helped in structuring and identifying key areas for the literature review.

The purpose of the literature review is to understand Indian manuscriptlogy in context of composition and layout design along with design concepts of modern graphic design.

Handwritten manuscripts are considered as one amongst various tangible cultural heritage of India. Since they are available in huge numbers and are preserved at various repositories across the country (Gaur R. , 2011), the scope of the study has been kept limited to Maharashtra and, the script of the region was Devanagari in the seventeenth century.

2.1.1 Aim of Literature Review

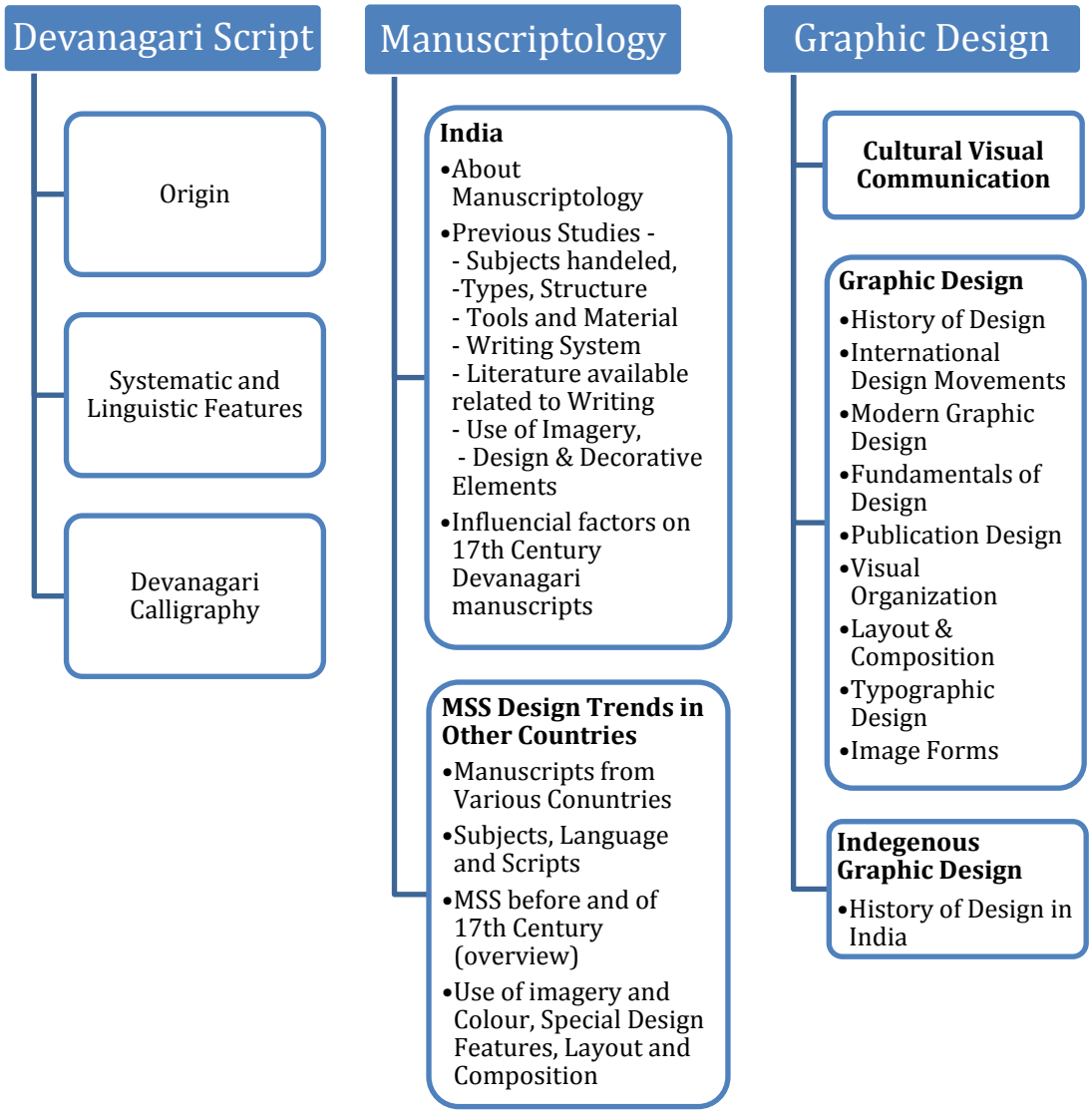
- To establish theoretical framework; to identify available literature related to study of Layout and Composition of the seventeenth century Devanagari Brahmanical manuscript in Maharashtra, and to compare them with design concepts of modern graphic design
- Identify various studies carried out previously in the relevant field
- Establish the area of study
- To find out research gap

2.1.2 Research Objectives

- To identify key terms, definitions, terminology, and variables in the layout and composition of the seventeenth century Devanagari Brahmanical manuscripts
- To explore possible linkages between the seventeenth century Devanagari Brahmanical manuscripts of Maharashtra and design concepts of modern graphic design followed in India. The focus of the study is especially on ‘Publication Design’.
- To investigate the history of publication design, i.e. Book Design evolved through the seventeenth century Devanagari Brahmanical Manuscripts available in Maharashtra, and the use of ‘Fundamental Design Principles’ for visual communication.
- Influence of other cultural designs on the seventeenth century Devanagari Brahmanical manuscripts.
- To know more about the knowledge of design prior to the printing revolution, the latter began in Maharashtra in the eighteenth century.

2.1.3 Research Model for Literature Review

Table 2.1: Theoretical Framework for Literature Review & Research Work



2.2 Overview of Devanagari Script

Devanagari, a widely used script in India in large proportion among the various Indian scripts (Kumar, Committees and Commissions in India, 1947-73: 1977 (4 v.), 1975, p. 65). This script is mainly used to write Marathi, Sanskrit, Hindi, Nepali as well as more than 36 Indian languages (Bright, 1996, p. 384). Maharashtra is one of the states of India, and the language of the state is Marathi. This script is adopted to write Balbodh Devanagari (Kapoor, 2002, p. 4511; Bhagwat, 1961).

2.2.1 Origin

Many scholars in the field affirmed that like all other South Asian scripts, Devanagari is also originated and developed from Ashokan Brahmi script (Hebbar, 1988, p. 253; Naik, 1965, p. 111; Maurer, 1976, pp. 101-104) (Bright, 1996, p. 384) (Murthy R. S., 1996, p. 13).

B.S. Naik quoted the study of R. Shamasastry regarding the origin of Devanagari script in 'Typography of Devanagari'. Shamasastry wrote three articles on '*A Theory of the origin of the Devanagari alphabet*' in the Indian Antiquary. The articles published in 1906, explaining theory based on tantric literature about the origin of Devanagari. His view contradicts to Bulher and Cunningham.(Naik, 1965, p. 77).

Several studies regarding the etymology of 'Devanagari' revealed that the name 'Devanagari' derived from the script belongs to the 'City of Gods' and the city is Pataliputra i.e. Patna of today. Devanagari was also known as '*Nagari'* earlier. In a late ninth century, the term 'Devanagari' came into use (Naik, 1965; Maurer, 1976; Bright, South Asian Writing Systems: The Devanagari Script, 1996, p. 384).

Kakasaheb Kelkar argues (as cited in Naik, 1965), that the Varanasi city was known as Devan-nagari, i.e. 'City of Gods', so the script is to honour city, i.e. 'Devanagari'. References of '*Nagari'* are found in the *Setu-Bandhan* of Bhaskaranand and '*Vatulgama'* (Naik, 1965, p. 113).

According to Pt. Gaurishankar Oza, a script similar to today's Devanagari existed in south India since the eighth century AD, i.e. much before it is seen in north India. From the eleventh century onwards, some elements of the *Nagari* script and the *Kutil* script combined to develop a new script. The element such as *shirorekha* is developed from this combination. The width of *Shirorekha* is generally equivalent to the width of *akshara*. As a result letterforms are transformed as today's Devanagari in the twelfth century (Ojha, 1977, p. 54).

Wujastyk thinks that '*Siddhamaṭṛka'* is the ancestor of Devanagari script (Wujastyk, 2014, pp. 159-182).

According to Murthy, Devanagari script was fully developed by the 10^{th} -11^{th} centuries AD. It was originally called as '*Nagari-lipi'*. Currently, the script is known to Maharashtra as '*Balabodha'* (Murthy R. S., 1996, pp. 13,14)

B. S. Naik stated in his *'Typography of Devanagari'* that the development of Nagari letters is noticable from the eighth century. The use of *Nagari* characters are found in a grant-deed of Rashtrakuta king Dantidurga (AD 754) in South India; in a grant-deed of Rashtrakuta ruler Govind (794 AD) found in Paithan and in a grant-deed of Mahendrapal (AD 955) (Naik, 1965, p. 113).

2.2.2 Systematic and Linguistic Features of Devanagari Script

Devanagari script is composed of thirty-four consonants and fourteen vowels. In addition, there are two vowels and two consonant-compounds (Naik, 1965, p. 175).

Characteristics of Devanagari script are: it is phonological script; written from left to right; typologically it is called 'alphasyllabary' because each unit consists of consonant and vowel known as *'askshara'*; vowel symbol functions as diacritic (Bright, South Asian Writing Systems: The Devanagari Script, 1996, p. 384; Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008).

This Indic writing style is known as 'abugidas', means segmental writing. This writing system is based on consonant and vowel sign is secondary but essential (Bright, 1996, p. 384; Bordeau, 2010).

Bhagwat has classified critically Devanagari letters by arranging them in groups. They are formed according to size, complexity, elements, designs, etc. While comparing Devanagari with Roman script, it is observed that ascender area of Roman characters is utilized for *matras*, *velantis*, and *rafars* in Devanagari; and descender area of Roman script is utilized for *ukars*, *rafars* and the *halant* sign (Naik, 1965, p. 205).

Consonants are written below headline or *Shriorekha* unlike Roman script where characters are based on base line (An Introductory Manual of Devanagari Calligraphy, 2015).

Bhagwat constructed the structure of the Devanagari script, as shown below in figure 2.1. It is made up of curves, loops, hooks, circles, and straight lines. All these shapes form multifaceted angled dashes and dots. (Naik, 1965, p. 209)

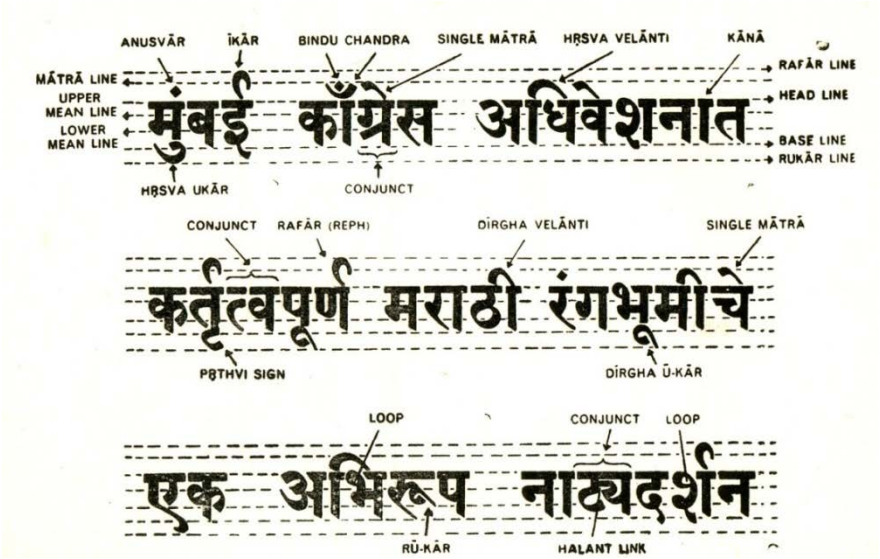


Figure 2.1: Various Elements of Devanagari Script (Naik, 1965, p. 214)

2.2.3 Devanagari Calligraphy

According to Murthy, decorating letters and writing in various styles called ‘calligraphy’ (Murthy R. S., 1996, p. 1).

A conventional tool used for writing Devanagari script is a reed or bamboo pen. The tip of pen has forced cut in 45 degrees. (Naik, 1965). The height of the letterform depends on the width of the nib. Cut-angle of reed pen may vary between 35 to 40 degrees to get flat writing edge (An Introductory Manual of Devanagari Calligraphy, 2015).

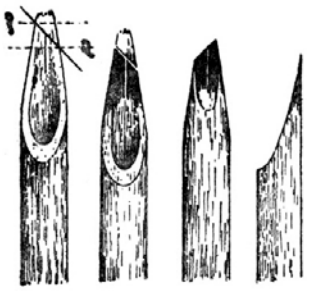


Figure 2. 2: *Bamboo* Pen (Naik, 1965, p. 214)

Joshi elucidates regarding reed pen and how it functions while writing Devanagari script. For instance, a reed pen is made from dry plant stalk, and the flat side of it has zero thickness. While drawing lines it is by changing angle of a reed pen one can get very thick line at one place and very thin line at another place (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 266).

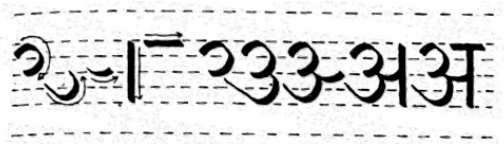


Figure 2.3: Writing Sequence of Devanagari script with different units to form a character '**अ**' (Gokhale, Design Parameters of Devanagari, 1983).

Devanagari script has evolved in the last so many centuries and one can easily see the change in the form. (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 274)

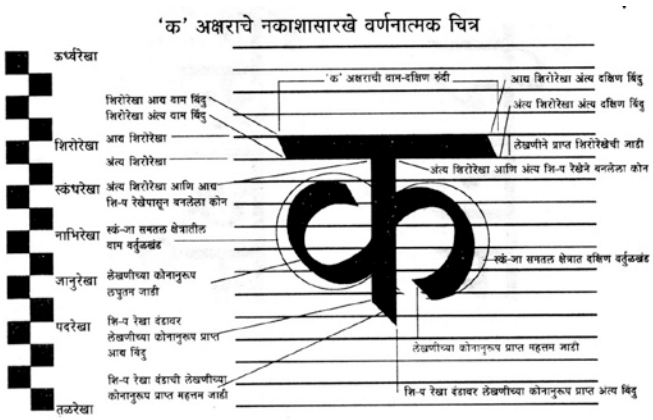


Figure 2.4: Minute Anatomy — Details of Devanagari Letterform, (Gokhale, *Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha,* 2008, p. 47)

In 1957, the Committees and Commission in India advocated adoption of Devanagari script for writing optionally other Indian languages. Hence, the reformation of the script was suggested in bringing standardization (Kumar, Committees and Commissions in India, 1947-73: 1977 (4 v.), 1993, p. 65). The standardization of Devanagari was finalized by Education Ministry on 21st January, 1960 which helped in technical production of types (Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008, p. 25) (Wakankar L. S., 1968, p. 105).

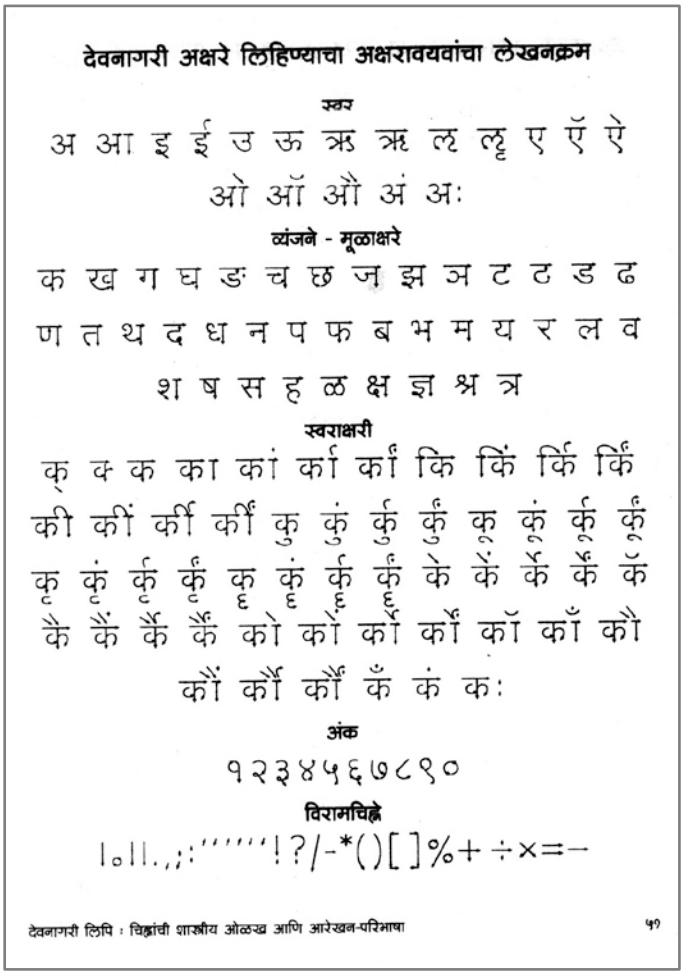


Figure 2.5: Devanagari Letterforms with Writing Sequence (Gokhale, *Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha*, 2008, p. 51)

2.3 Previous Studies in Indian Manuscript Design

According to Sarkar, the objective of the study of manuscripts is to enlighten the traditional characteristic of the nation, its culture and best qualities of a human being of that era (Sarkar J. , 2012, p. 121). Sarkar thinks that Indian manuscripts have a continuity and hugeness. According to him, the formal aspects of manuscripts include structural investigation of elements linked to visual and aesthetic qualities (Sarkar J. , 2012, p. 116).

R.S. Shivaganesha Murthy in his *'Introduction to Manuscriptology'*, explicitly incorporated topics related to Indian Manuscripts, such as antiquity of writing in India, related references in the ancient literature, materials, instruments, process, preservation and cataloguing, critical recension etc. According to Murthy, the ancient manuscripts are the link between past and present. They are helpful for reconstruction of Indian literary tradition (Murthy R. S., 1996, p. xi).

A survey conducted by Palit shows that there are several manuscripts scattered all over India, among them 67 percent are in Sanskrit; 25 percent are in other Indian languages and 8 percent are in non-Indian languages (Palit, 2010, p. i)**.**

2.3.1 Definition of 'Manuscript'

The National Mission of Manuscript, established under 'Ministry of Tourism and Culture', Government of India in 2003, defined manuscript as a handwritten composition on paper, bark, cloth, metal, palm-leaf or any other material dating back at least seventy-five years. It has significant scientific, historical or aesthetic value (Indian Manuscripts: What is Manuscript, 2007).

According to Bhoi, a 'Manuscript' is a Latin word; *manu* means 'by hand' and *scriptum* or *scribere* means 'to write'. Thus, it is a material or a thing, which is handwritten (Bhoi, 2010, pp. 71-92). Palit defined it as '*Manuscriptus',* the Latin word consists of two terms *'mane'* and '*criputs'* which mean hand written (Palit, 2010, p. xix).

According to Tripathi, a literary tradition has a material basis, and it has to be studied under various disciplines such as paleography, art history, and chronology. Chandrabhal Tripathi puts together meaning of 'Manuscriptology' defined by modern Indian scholars as, (i) *hasta-likhita-prati,* (ii) *hasta-prati*, (iii) *hasta-likhita-grantha*, (iv) *grantha*, (v*) hasta-likhita-pothi*, (vi) *likhita-pustaka*, and (vii) *pustaka*. There are few traditional terms for manuscript such as '*pothi'*, which was used in Maharashtra and Gujarat. In Bengal it was called as '*punthi'* or *puthi'*. In early Jaina literature, it is mentioned as '*gatha potthaga'*. A term '*Pustak'* was used in the medieval period (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, pp. 15-16).

2.3.2 Subjects handled and Types of Manuscripts

Palit found that the subjects of Indian manuscript are related to Jainism, Hinduism, science, mythology, Indian philosophy, literature and, they are written in various Indian scripts (Palit, 2010, pp. xix, xx).

Velankar in his 'Descriptive Catalogue of *Sanskrit* and *Prakrit* Manuscripts, classified subjects dealt in manuscripts into four categories: (i) Technical Literature (Linguistic Science, Literary Science, Medicine, Astronomy and Astrology, Architecture); (ii) Hindu Literature (*Veda*, *Vedic Dharmashashtra*, *Tantra*, *Purana*, Philosophy, *Kavaya*, *Stotra*); (iii) Jaina Literature (*Agama*, Philosophy, Legends, Poems, *Stotra*) and;

(iv) Vernacular Literature (Gujarati, Hindi, Marathi and Buddhist manuscripts) (Velankar, 1998).

According to Ranade, the Buddhists copied and maintained Buddhist texts in libraries. Buddhist monks travelled and stayed in a large number *Viharas* in the Deccan region. The other religious sect namely the Jainas also maintained a large number of libraries or *bhandaras*. Progression of *Bhakti* movement initiated by Chakradhar Swami, Saint Jnyaneshwar, and the rise in a number of religious sects added a lot of devotional and poetic literature in the Marathi language. All Mahanubhava literature is found written on paper and copied in a large number. Ranade elaborated the list of books and excellent libraries in the monasteries established by Samartha Ramdas. This enlisted literature is found written mainly in the areas of epics, *stotras*, rituals, *tantra*, philosophy, mythology and astrology. Ramdas insisted on the significance of the art of writing (Ranade U. , 1983, pp. 18-27).

The Gilgit manuscripts discovered in an old brittle Buddhist *stupa* in 1931 in Gilgit area in Kashmir. These are the oldest manuscript found in India. Key features of these manuscripts are, Period: 5th-6th century AD; Material: Birch bark; Language: Hybrid Sanskrit; Script: Gupta Brahmi & post-Gupta Brahmi; Subject: Buddhism, its ritual, philosophy, iconometry, folk tales, medicine and several others related to areas of life and knowledge(Jatoo, 2013-14, p. 25).

2.3.3 Medium of Writing

According to Naik, the most common material used in ancient south India to write manuscripts were *Tada-patra* (palm leaves); and in north India *Bhurja-patra* (birch bark) respectively. Though the paper came into use in China in the beginning of the second century A.D., the evidence of use paper for writing manuscripts in India are seen from the eleventh century onwards (Naik, 1965, pp. 13-18).

Murthy states, that the Palm-leaf and Birchbark were used from early times. Chinese traveller Itsing bought the paper to India during 6-7 century AD for copying manuscripts. However, it was known to Indians in Mughal reign. Paper was manufactured in Siyalkot, Kashmir, Kagazipada near Vikramsila in Bihar, Kagajpura near Daulatabad. Siyalkot paper was known for fine finish during Akbar's' reign (Murthy R. S., 1996, pp. 25-35).

Satyendra states that during Akbar's reign, Siyalakot was a well-known educational center, and there were industries producing ink and paper. 'Mansinghi Kagaz', an

excellent quality paper from Siyalakot was very popular. The paper was also produced in Kashmir, Jaipur, Jodhpur, Sawai Madhopur, etc. during the medieval period (Satyendra, 1978, p. 83).

According to Palit, in India various mediums for writing were explored, e.g. clay tablets, stones, metals, ivory, tortoise shell, tree barks, and leaves, animal skins, and cotton and silk. Tulat paper and handmade paper were popular medium (Palit, 2010, p. xix).

2.3.4 Template Design Tools

Scribes used '*Rekhapati'* or '*Samasapati'* to draw parallel and straight lines on a paper. A thread woven through the holes at the edges of the plate in such a way that on the front side all threads are parallel to each other horizontally. First, some mixture is applied to the threads on their parallel side and then the impression of these lines (rules) were obtained on paper. The impression is taken by keeping paper above parallel lines on a plate and by applying pressure using finger over the thread. In the centre of two lines, again another set of the line is marked using '*Rekhapati'*. After horizontal grid lines are marked, two vertical margin lines on left and right sides are marked using red ink. Jaina monks used such type of beautiful plates for marking lines. In Rajasthan, scribes used '*Kamba'*, a thick ruler made of wood (Ojha, 1977, pp. 121-122).

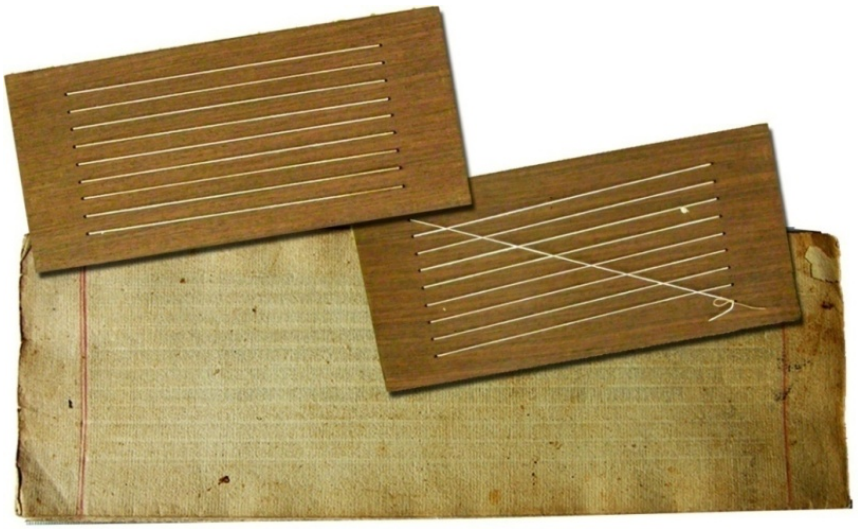


Figure 2.6: *Rekhapati* —.Front and back sides with woven thread and ruled lines on paper. Courtsey: Vedic Samshodhan Mandal, Pune.

2.3.5 Manuscript Writing Tools and Instruments

According to Murthy, the manuscripts were written and copied but every scribe had his own peculiar style of writing. Therefore, each manuscript is found different from other.

The style of writing may vary with the use of instrument as well as it depends on a scribe of a particular school (Murthy R. S., 1996, pp. 16, 17).

Pangarkar commented and elaborated very well on the verses written on 'art of writing' i.e. '*Lekhan-kriya-nirupaṇa'*(*Dasak* 19, *Samas* 1) by the noted saint and poet Samarth Ramadas (1608-1681 AD) of Maharashtra in the seventeenth century. These are the instructions for his disciples or to scribes. Ramadas touched upon all aspects of manuscriptology i.e. materials, process, and calligraphy. He also emphasised on illustrations, painting i.e. ornamentation and decoration, aesthetics, and finally binding and preservation of a book (Ramdas, 1990, pp. 688,689).

Murthy distinguished writing instruments into three types: (i) hard or sharp tips to incise, e.g. stylus called *'shalaka'* or *'lohakantaka'*; (ii) soft and smooth tips to write, e.g. *'lekhani* ; (iii) brush to paint. (Murthy R. S., 1996, p. 49).



Figure 2.7: New manuscript inscribed by the stylus. Tip of the stylus made of metal and its body is made of wood. Lanna manuscripts. (EFEO Bangkok Centre)

Terms used for various writing tools namely, (1) *Lekhani*, brush made of fibers; (2) *Kalama*, reed pen; (3) *Tuli* or *Tulika*, brush; (4) *Varnika*, pointed wooden pen; (5) *Varna Vartika*, colour pencil; and (6) *Shalaa*, round pointed tool used for engraving. Stylus used in south India to scratch on palm-leaf (Naik, 1965, p. 19) (Ojha, 1977, pp. 120-121). A compass is frequently used for making geometrical illustrations such as lotus, astrological charts, etc. A *shalaka* is used to draw margin lines and other horizontal and vertical lines (Ojha, 1977, p. 121). Murthy also stated that the rulers, compasses, and bow pens were used to draw lines, circles and patterns. Along with these materials, *'Rekhapati'* or *'Samasapati'*, burnishing stone, counch for polishing and knife were used. Murthy mentioned different terms for reed pen, e.g. *'akshara-tulika'*, and for tablet or board *'akhara-bhumika. Kachana'* is a term used for string, which was used for tying leaves of manuscript. (Murthy R. S., 1996, p. 50).

Palit observed that for writing purpose along with metal and bamboo nib, the feathers of peacock and vultures also were in use (Palit, 2010, p. xx).

Muni Shri PunyaVijayji listed basic material and writing equipments and other instruments utilized in making a book in ancient Jaina literature namely, *'Rajaprashriyopaga-sutra'*. These materials are: 1) *patra* (leaves) (2) *masi* (ink); (3) *lekhani* (pen); (4) *dora* (thread); (5) *kashtha* (kambi, supporting wooden boards); (6) *chadan* (covering); (7) *granthi* (a thread passed through the hole made in folios and a book tied with knot); (8) *lipyasana* (material on which text is written); (9) *akshara* (character); (10) *shinkhala*; (11) *Haratal* (to remove wrong text) (Punyavijay, 1938, p. 18; Satyendra, 1978, pp. 19,20; Murthy R. S., 1996, p. 24).



Figure 2.8: Ink-pots, Source: Private publication 'Dipping into the Glorious Past', Raja Dinkar Kelkar Museum, Pune

2.3.6 Ink

Naik states that black ink which is mentioned in '*Grhya-Sutra'* called '*Masi'*. It was used for writing before the fourth century BC. Black ink was made of powder of charcoal mixed with gum, sugar and water. Permanent ink, made up of borax, *lodhra* and lamp-black was made from sesame oil. Apart from this, red colour (made from *hingula);* green and yellow colours were also used in manuscript writing. Gold and silver inks were used in illuminated manuscripts (Naik, 1965, p. 19).

Y.K. Bukhari described rare information in his article on 'pigments' collected from manuscripts '*Asrarul Khat*' i.e. *the Secret of Calligraphy'* written in 1690 A.D. during the reign of Mughal emperor Aurangzeb, now available at National Museum, New Delhi. Topics incorporated in '*Asrarul Khat'* manuscripts are related to paper, colours and its

kinds, calligraphy, ink, preparing *wasli*, knife, pen and inks, gold solution, and various types of colour preparation e.g. Lamp black (s*iyahi*), vermilion, verdigris (*zanga*), and two properties of lapis-lazuli (*lajaward*) i.e *Asli* -natural and *Amali* - artificial (Y.K.Bukhari, 1963).

2.3.7 Sizes and Forms of the Manuscripts

Manuscripts found in India are mostly oblong and square. The reason behind oblong size of palm-leaf manuscript lies in the shape of palm leaf. There could be a possibility of changing the format because of a wide range of paper sizes (Murthy R. S., 1996, pp. 36, 104).

Schuyler communicates the size of palm-leaf; which was approximately eighteen inches long and double in the middle. Then they were cut in the midrib, and out of the single leaf, two leaves for writing were made. (Montgomery Schuyler, 1908, pp. 281-283).

Muni Punyavijay referred various types of manuscripts from '*Dashavaikalika Haribhadrikatika'*. The type of manuscripts mentioned are: '*Gandi'* – a book wider in the middle than at the end; '*Kacchapi'* – like tortoise shape; '*Musti'* – can be held in a fist; '*Samputa-phalaka'* and *Chepati* or *Chivadi* or *Shrapatika* – thin book with few leaves; and '*Chedapati'* – a book with very few leaves (Punyavijay, 1938, pp. 22-24).

There are other forms of stitched manuscript found in north India mentioned by Satyendra, they are *Pothi*, *Gutka* (both are centre-stitched books while *Gutka* size can be 6 in x 4.5 in), book like *Pustika* (bigger in size around 21 in x 4.5 in), *Pustika* (size around 7.5 in x 5.25in), and *Panavali*. *Potho* size manuscript is thicker than *Pothi*. It is stitched either at the center or on the side. *Panavali* which is an oblong form of manuscript stitched at the shorter side is also called *pothi*. *Patra* is loose sheets type of a book (Murthy R. S., 1996, pp. 103-104; Satyendra, 1978, p. 82).

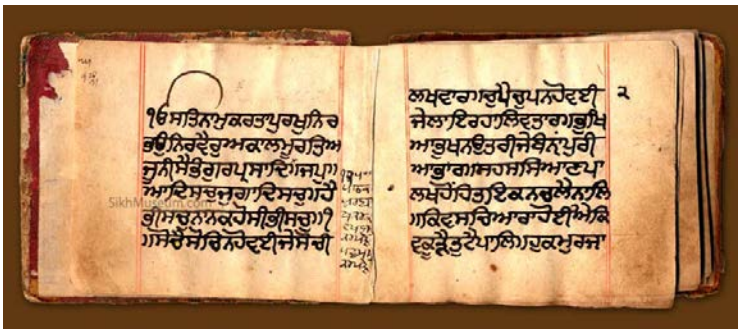


Figure 2.9: Gutka Manuscript, a small book of hymns from the Guru Granth Sahib, Dr. Gurpal Singh Bhuller collection, (SikhMuseum.com, 2013)

Murthy observed that although the manuscripts available in various sizes but the leaves of one manuscript are of uniform size as in modern book design (which is noted in all types of material used to write manuscripts e.g. palm-leaf, paper, etc.) The factors need to be considered while choosing the size of paper, they are: purpose and text content including personal liking. (Murthy R. S., 1996, p. 104).

Ranade observed that the oblong was the most popular form of the manuscript during the seventeenth century in Maharashtra. A very few experimental layouts in the vertical format are seen (Ranade P. , Form and Page Turning Function of 17th century Devanagari Manuscripts of Maharashtra (India) , 2015, pp. 2-12).

2.3.8 Schematic Structure of the Manuscripts

Sivaramkrishna highlighted traditional Indian structure for writing, using a rhetorical mode known as *'anubandha chatushtaya'*. It comprises four elements, such as: *adhikari, prayojana, sambadh* and *vishay*. *Adhikari* means target audience; *prayojana* is the purpose of writing; *sambandh* is a relationship of the subject with other subjects; and *vishay* is the theme or object of knowledge. (Sivaramkrishna, 1998, pp. 7-13)

Bhoi explained a subject matter of Odisha manuscripts, that are usually divided into four parts: (i) *mangalacharan* i.e. to honor god or goddess; (ii) the main body of manuscript; (iii) conclusion or end; (iv) and *pushpika* or a colophon (Bhoi, 2010). Colophon reveals many aspects of the manuscript e.g. scribe, owner, author, subject, deity, beliefs, family, dynasty, cultural perspectives, historical information, place where it is written, date, etc. (Unpublished Ph.D. Thesis, Use of Palm leaf Manuscripts as a Historical Source: An Ethno-Historic Study with Reference to Orissa, p. 12).

Nandi and Palit describe various parts of manuscripts other than main body text, they are: *blionita* or preamble which reveals the name of manuscripts and *pushpika* or colophon. The latter is generally found on the first or the last folio, speaks briefly about autobiography of the writer, the name of the manuscript, the date of text, the name of the scribe, etc. (Palit, 2010, p. xx).



Figure 2.10: Opening and Closing Page with Floral Decoration, (*Jnātadharma-kathā* (*Prakrit* d. 4), 2016). Courtesy: Bodleian Libraries, University of Oxford

Rana thinks, there are three types of colophon (*upasamhara* / *pushpika*) that appear at the end of the chapter. Colophon contains detailed description of the author and the scribe, and date of composition. Their types are: inter-text colophon (end of chapter – *'itiprathmo'dyayosamapt')*, text colophon – (*'itisamaptoyamgranthah'*), and post colophon – (written by scribe i.e uttarpushpika). Post colophon is very important as it states the history of the manuscript, namely the author, scribe, date of composition, purpose of writing or copying, praise of patron, writing by order of a king or a royal person, and sometimes handling and preservation of manuscript (Rana, 2006, p. 6).

According to Satyendra, '*pushika'* or colophon comprises of the name of the author, when it was written i.e. the period with details, *swasti wachan*, reason, dedication, dynasty, laudation, imprecation, etc. (Satyendra, 1978, p. 48).

According to Murthy, the colophon which is added at the end of section/cantos, provides information about title of work, poet/author name, place of author, name of patron, date of completion of work, and sometimes the number of verses contained in the work; and ends with salutation (Murthy R. S., 1996, p. 107).

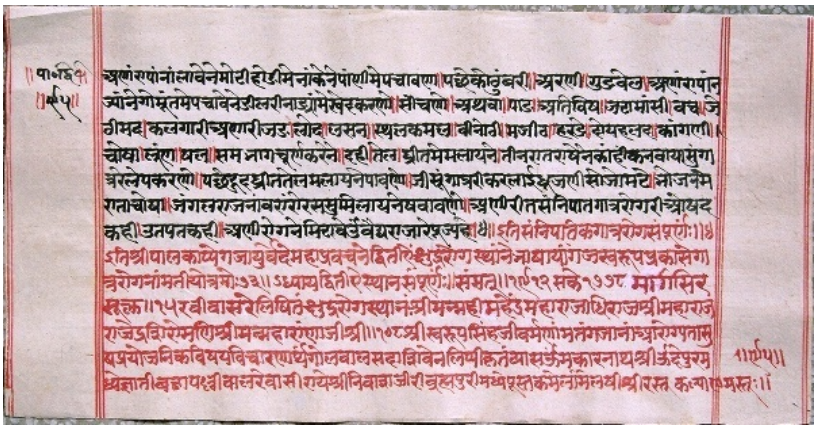


Figure 2.11: Colophon Written with Red Colour Ink, Paper Manuscript Courtesy – National Mission for Manuscript, India

2.3.9 Grids and Columns



Figure 2.12: Column Grid, *Astasahasrika Prajnaparamita Sutra* - Indian palm leaf manuscript written in the 11th century (Henss, 2007)

Tripathi observed that the palm-leaf manuscripts are frequently found divided into two or three columns. The continuity of the text in these manuscripts set horizontally in the same line across the columns (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 24).

The most recent study conducted by Bokil is about various forms of grids and their use in the layouts. He thinks that the grid is employed in the layout as a syntactic device to prepare a framework of 2D surface. He found that in India a grid is the part of the tradition and it has been practiced in the art related to religion. Types of grids practiced, such as, (i) a grid in the form of dots to draw rangoli patterns, (ii) syntactic grid using space division to draw portraits or sculpture making, (iii) semantic modular grid used in paintings, (iv) hierarchical grid to show hierarchy among various visual elements (Bokil, 2009, pp. 42-48).



Figure 2.13: Illustrations placed within Hierarchical Grid - *Uttaradhyayanasutra*; Kapila(Museum and the Victoria & Albert Museum', British Library and Institute of Jainology, 2006). © Victoria Albert Museum, London

2.3.10 Composition and Editorial Styles of Indian Manuscripts

Murthy has defined three types of manuscripts depending upon writer, composition, and copier. The first is an 'autograph copy – a manuscript written by author himself or composition dictated to someone by author. The second type is 'immediate copy' – in this type, a copy is made from an autograph copy but not under the supervision of author. The third type is 'transmitted text'– where the original text is copied by many in stages (Murthy R. S., 1996, pp. 112,113).

Tripathi has distinguished manuscripts of three types: (1) simple type contains only one text; (2) Bibliotèhque collective type with different parts or folios collected together in case of loosing folio (repair work). It has no uniformity and; (3) composite – more or less closely related text of different manuscripts or addition in to free margin areas (marginalia) later by scribes (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, pp. 18-20).

Satyendra observed that in ancient times the words were written continuously with no space left in-between. The letters also were written independently. Clarity in linguistics and grammar guided manuscript artist in not using the space between words (Satyendra, 1978, p. 34).

Olivelle studied Kautilya's *'Arthashastra'*—(chapter 10) in the time of Chandragupta Maurya, in which Kautilya mentioned qualities of the scribe and composition of the letter (2.10.23). According to Kautilya, the scribe in the king's court should be aware of all rules, develop the ability to write quickly, should have beautiful handwriting, and adopt ability to read a document. Kautilya further classified ideal qualities of document, such as: sequence for any document main points should be stated in the beginning; consistency in the statements without repetition. Completeness of document means – wherever necessary scribe should add reason, citations, and illustration; document should end with a word '*iti*' which serves as concluding word. Kautilya also referred a cluster of minimum one and maximum three words, and this collection of words makes a sentence. (Olivelle, 2013, pp. 119, 120).

Tripathi explains different layout structures of a manuscript based on the text. Whenever there is only one text, a layout has to be presented one after other. This method is suitable for reading. A few other conventional methods were used for page layouts when there is

a text (*mula*) and commentary. (i) In the first method, main text (*mula*) runs parallel to the commentary; (ii) the second method termed as '*tripatha'* type where the page has three parallel script areas. The area in the vertical center is '*mula'* or the main text, and the commentary is written above and below the main text; (iii) the third method is called as '*panchapatha'* type. Page has three parallel script lines along with two vertical margin areas from left and right side; (iv) the fourth, Jaina method known as '*sudha'* or '*shudha'* in which '*mula'* and commentary is written in the form of continuous chain (m-c-m-c ..). Different colour of ink was used, for instance red to write '*mula'* and a black to write commentary. *Tripatha* and *Panchapatha* types were introduced in 15th century of Vikram Era (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 27)

Tripathi's principle observations on the Jaina manuscripts are: (i) *mangalacharana* means beginning, and the text colophon means end of manuscripts; (ii) some manuscripts have main text i.e. '*mula'* and it is accompanied by commentary i.e. '*chhaya'*; (iii) generally the foliation is done in '*ankalipi'* but he found '*aksharlipi'* in addition to '*ankalipi'* in two palm-leaf manuscripts from northern India. He further adds that the manuscripts are found in two formats: one is *phothi*, which derived from the palm-leaf format with turning the edge on the top, and the other is *gutaka* format. The *gutakas* have turning edge to the left and are of small pocketsize (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 18).

According to Rana, various style of writing found in Indian manuscripts. They are *tripatha*, *caturpatha*, *suksmaksari* and *sunda* (Rana, 2006, p. 6).

Satyendra describes manuscripts writing technique using the rhythmic linguistic meter. Most of the manuscripts are noticed in '*Anushtupa'* meter, which consists of 32 characters from 4 stanzas (*charna*). One stanza equals 8 characters. So total number of characters are 32. Therefore, after counting the lines on every page one could know number of characters used in the manuscript.

Rajendralal Mitra (1824 – 1891), the first modern' Indologist and librarian of 'Asiatic Society', studied ancient literature '*Prashati-prakashika'* (as cited in Murthy R. S., 1996). It is an article related to letter writing composed during King Bhoja of Dhara (11th century). The article suggests folding techniqes of the material for letters, leaving long space as a left margin, as well as a space in front for decoration using gold-leaf. Mitra

also cites reference of a verse in the '*Samhita'* written by Vyasa, which refers process of how a draft of a document is to be finalized by writing on the wooden board, and finally after corrections, transferred to *patra* (Murthy R. S., 1996, pp. 34-35).



Figure 2.14: '*Mewar Ramayan'* Work commissioned by Maharaja Jagat Singh. (Online Gallery, Virtual Books, *Mewar Ramayan*:The British Library)

Tripathi noticed that for those manuscripts in which number of lines per folio remain constant, are found well executed and that too done by a single scribe. Due to negligence or change in a scribe, one can find an odd number of lines in the manuscripts (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 24).

Naik and Dalvi have studied Jaina manuscript, namely *'Kalpasutra'*; a few observations documented are: (i) notes found written in smaller size than the main text; (ii) balanced the composition with grey texture text and had wide margins; (iii) leading space between two successive lines is found less than the height of letter (Naik & Dalvi, 2015).

2.3.11 Design Features of Indian Manuscripts

While conducting a study of page composition of medieval Indian manuscripts, Ranade observed that Indian manuscript designers of medieval period have tried to create harmony, which includes all fundamentals of design. Space division using columns was practiced in page layouts. Design elements such as colours, contrast, proportions, along with image, text, motifs, and margins were also used. To help reader to navigate within manuscripts, page navigation system is employed in the manuscript designs. As a result

they added not only visual movement in layout but also an visual order to guide the reader to read information in particular order (Ranade M. P., 2015, pp. 37-42).

According to Satyendra, it is observed that certain trends were followed by writers/scribes/copiers of the manuscripts, they are: 1) '*Lekhandisha*'– writing direction for Devanagari it is from left to right; (2) *'Pankti- baddhata,'*– defined structure for lines using '*Rekhapati'* or *'Kambika'* (rule) and predefined size of a letter in which width and height of a letter are same; (3) Text is written continuously without spacing; 4) Punctuation marks of a single or a double *danda* with various other marks; 5) Page numbering — generally page numbers were given for folio, not for every page and the place for page number can be upper left or bottom right margin area; 6) 16 types of standardized marks for critical words which are difficult to read while copying; 7) Symbols for missing text or a word e.g. *kakapada*, (^,V.,X) or *Kundala* (o); 8) Abbreviations, e.g हेमन्त - हे.(Satyendra, 1978, pp. 33-43).

Running hand known as '*Modi*' type of text is written for official/trade record purpose (Murthy R. S., 1996, p. 107; Joshi, Calligraphy the Art of Writing, 1984, p. 129).

2.2.12 Calligraphy

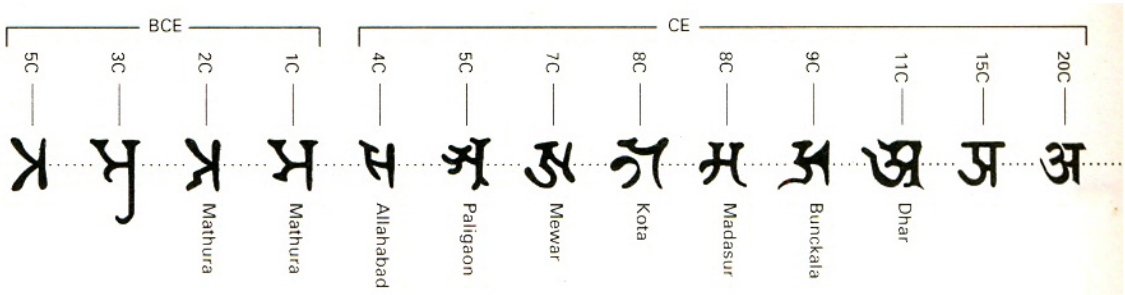


Figure 2.15: Development of Devanagari Script, (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 274)

Joshi listed various styles of Devanagari script, which are influenced by other Indian scripts. They are based on design aspects such as headline, vertical strokes, serifs (angular, upward short curve), thickness of scripts, forms (curvilinear, condensed , informal, etc.); The region and styles are (i) North-East influence: Pala style; (ii) South influence: Rounded style; (iii) Western Jaina: Decorative style; (iv) Western Gujarat: Folk style (Joshi, Calligraphy the Art of Writing, 1984, pp. 128,129).

Wakankar commented on *Lekhapaddhati'* written by Prasad. It is a compilation of Sanskrit documents prior to Sultanate period (approx 8 / 9 Century AD) in Gujarat, (as

cited in Wakankar S. Y., 1983). The text incorporates few suggestions, on: 'letters should be circular, compact, equal and symmetrical, well defined, that is nicely written in suitable measurements, having equal top'. Letter should be written in one straight line and it should not mix with each other. So that there should not be uncertainty in understanding or decifering text. Consistency should be maintained in distance between letters and lines. (Wakankar S. Y., 1983). Satyendra also pointed out the ideal stanza in '*Lipisaushthava'* which clarifies about how to write. (Satyendra, 1978, pp. 84, 85)

अक्षराणि समशीर्षाणि वर्तुलानि घनानि च
परस्परमलग्नानि यो लिखेत् स हि लेखकः ।।1।।

समानि समशीर्षाणि वर्तुलानि घनानि च ।
मात्रासु प्रतिबध्दानि यो जानाति स लेखकः ।।2।।

शीर्षोपेतान् ससंपूर्णान् शुभश्रेणिगतान् समान्
अक्षरान् वै लिखेद्यस्तु लेखकः स वरः स्मृतः ।।3।।

Figure 2.16: Elegance of Script, described in *Lipisaushthava* (Prasad, 2007; Satyendra, 1978, p. 85)

2.3.13 Colour, Images and Visual Hierarchy

Various colour inks were used in indigenous manuscripts, such as black, red, blue, green and yellow along with gold and silver. Green and yellow pigment mainly used in Jaina manuscripts. Many a times red ink is used for instance to paint margin borders on left and right sides; 'single *danda'*; 'double *danda'*; '*svarachinha'* (diacritic marks); beginning and end of chapters (colophon); to draw astrological charts, etc. In manuscripts from European red ink was used for various purpose, e.g. red glitter ink used for embellishment, for beginning letters or lines as 'rubrics'; and hence the scribe was called 'rubricator'. In India, these rubrics are known as '*Surkhi'* which means red as well as the title. Gold and Silver ink were used in India as well as abroad for jobs commissioned by kings, emperors and wealthy people who could afford them (Satyendra, 1978, pp. 59,60).

Ranade has pointed out that the designers of medieval Indian manuscripts were insightful about colour, shape, and size proportion. They have employed colour sensibly for punctuation marks, e.g. to show the end of sentence or verse; red colour was used for '*danda'*. A colour palate with limited number of colours were selected to design medieval Indian manuscripts. They also preferred colour variations using the densities of ink and type size that helped in creating a contrast between main text and marginalia text.

This generated visual hierarchy that guided a reader for preferential order of information. This contrast in the density of ink and different text sizes achieved momentum and rhythm in designing the layout. (Ranade M. P., 2015, p. 41).

A study of medieval Jaina manuscript done by Ranade using ‘Eye Movement Tracking Technology’ showed that the illustrated images in the manuscript design served the purpose of a focal point. Thus, ‘Emphasis’ element of principles of design has employed to create visual hierarchy. Because of contemplative use of colours in the images, the readers revisited the image area and spent more time in viewing the image. This showed that the colours used in image area were attracting the attention of a reader than their size or any other details. This resulted in producing engaging effect in the image area and ultimately readers had to pay more attention to understand the image (Ranade M. P., 2015, p. 41).

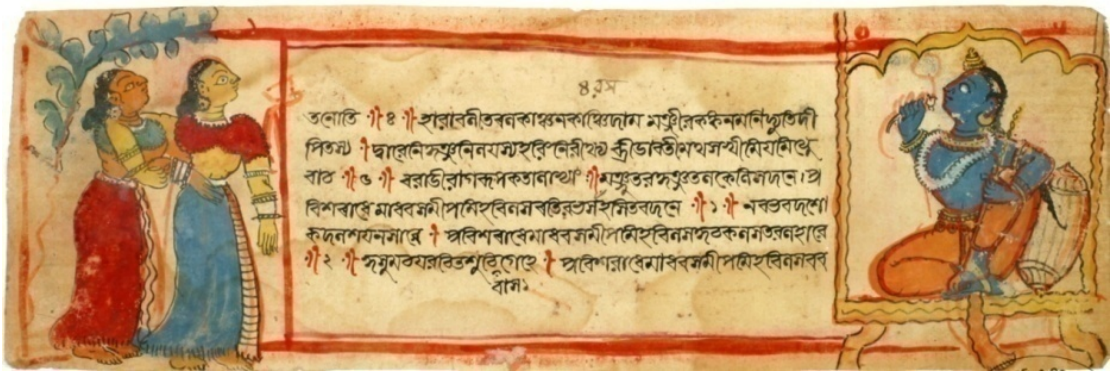


Figure 2.17: *Geeta Govinda*, Early Bengali language, 18th century (Museumsofindia)

Palit has noticed that in the Middle Ages the scribes mainly used black ink for writing. For titles red ink was used, and gold and silver were used for making manuscript exclusive (Palit, 2010, p. xx).

The ‘*Kalpasutra’*, in the collection of Shri. Kalyanmal Dhaddha of Ajmer, the first page of the text is found written with gold ink. According to Oza it is written in the seventeenth century (Ojha, 1977, p. 121).

Gough has studied Jaina *mantras*, *mandalas*, and their use of specific colours. Gough has further observed that in *'Rishibhamandala'*, a tantric diagram of 24 tirthankaras, each image of *thirthankaras* is portrayed with different colour along with their iconographical distinguishing markers. The roots of this contemporary colour scheme are found in Prakrit text *Āvassayanijjutti* (*Skt*. *Āvaśyakaniryukti*)(Gough, 2012, pp. 1-47).

According to Tripathi, colour inks were used by the scribes for a variety of purpose. For example, black ink was used for writing normal text; red ink was used for folio numbers, *dandas*, figures, marginal titles or for writing '*mula'* to differentiate it from commentary; whereas yellow (*hartal*) and white (*safedo*) were used for painting incorrect words (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg, 1975).

2.3.14 Illustrations, Illumination and Decorative Patterns

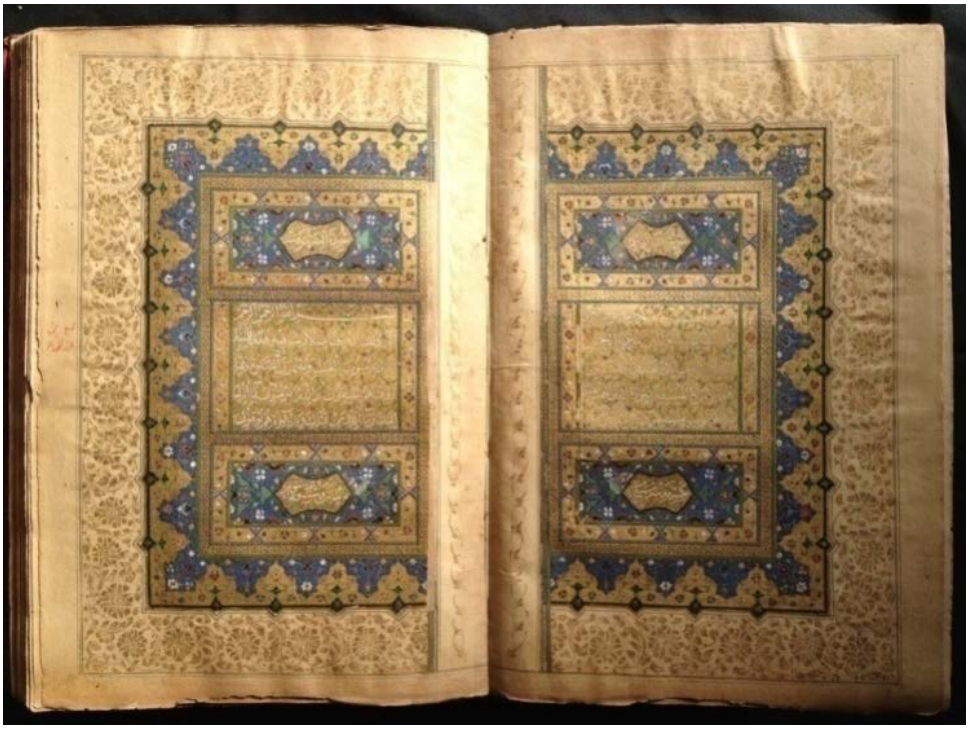


Figure 2.18: Islamic Manuscripts with Decorative Patterns on Borders, (Islamic Manuscript Network)

Ranade has observed that the introduction of paper ushered a revolution in the art of bookmaking. The manuscripts written in the thirteenth century are very plain and without any illumination. The scribes of Deccan region were aware of the great art of illustration and the art of manuscript illumination was happening in the adjacent state Gujarat. Just because of rigid attitude of scribes, books designed were very plain and simple. In the later period, the dynasties from Ahmednagar and Bijapur played an important role in the importing manuscript writing and copying skill from Persia. Persian styles of decoration incorporated in the illustrating manuscript were different from those of contemporary indigenous manuscript. The characteristics of Persian manuscripts are: (i) the vertical format, (ii) small size illustrations either placed on the side of the page, (iii) profuse use of gold and ultramarine in text, (iv) delicate scroll, and (v) highly decorated title page.

The influence of Persian illumination and decoration style are noticeable in northern India. In the Deccan area Sultanate followed indigenous tradition; mainly horizontal book format without any frame around text. There is no evidence that shows the influence of Persian illustrative manuscript on the manuscripts of Deccan. In the sixteenth and seventeenth centuries, very little illumination or decoration is seen in manuscripts of Deccan. The scribes did not pay much attention in the beautification of manuscripts (Ranade U. , 1983, pp. 24-27).

Murthy pointed out that a book illumination is not found before Akbar's reign; however, the mathematics and astronomy related texts often have related diagrams (Murthy R. S., 1996, p. 108).

Satyendra observed that during medieval period books are found illuminated for the purpose of embellishments with various designs, such as birds, animals, geometric patterns, scrolls, flowers, etc. These elements were added to enhance aesthetic value but they were not necessary always related to the content (Satyendra, 1978, p. 85).



Figure 2.19: Palm Leaf Manuscript with Illuminated Cover Page (Photo Gallery - Palm Leaf, 2016), Courtesy: National Mission for Manuscripts, India

For holding leaves of *Tada-patra* manuscript together, the scribes used to make a hole in every page to put a string across. In case of paper manuscript writing, the Jaina scribes imitated the structure of *Tada-patra*. For instance, on every page they left blank space, which was meant for hole and string. They decorated this space with a filled circle or four-sided well or some other ornamentation (Ojha, 1977, p. 112).



Figure 2.20: A Jaina Manuscript with Decorative Motifs, *Uttaradhyayana Sutra*, (*Uttaradhyayana Sutra*, Mahavira preaching). © British Library

In some manuscripts, e.g. Dhaval type from Orissa, the margins are found decorated with patterns (Murthy R. S., 1996, p. 108).

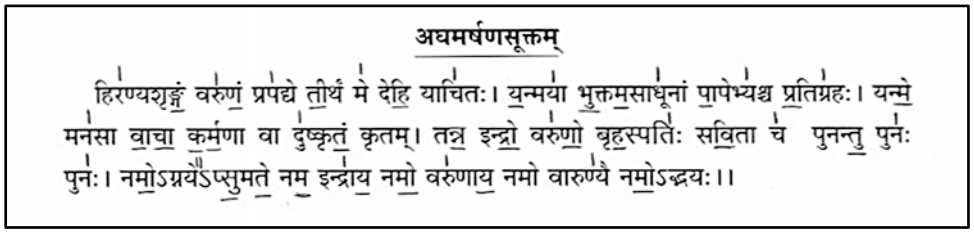
Palit has observed that the Indian manuscripts comprise mainly text and illustrations. The subjects of illustrations are related to mathematical calculations, maps, and clarifying figures. Border decoration, illuminated pictures, visually engaging initials, and decorated binding are found in illuminated manuscripts (Palit, 2010, p. xx).

2.3.15 Page Numbering

Murthy has noticed that page numbers are found marked on the left side of margin and that too in the middle part of it. Folio, which includes front and backside pages of manuscript, is numbered instead of every page (Murthy R. S., 1996, p. 106).

2.3.16 Accent Marks

Narasimha Suri has studied '*Svaramanjari'*, an ancient Indian literature. The text, according to him, emphasizes the importance of accents i.e. '*Svara Mahatmya'*. The text reveals mainly two types of accents: (i) *Udatta* – high accents (acute); (ii) *Anudatta* – low accent (grave). It is observed that various *samhitas* follow different styles of marking for these accents, e.g. *Udatta* is marked with a superscript bar in the *Maitrayani Samhita* and the *Kathaka Samhita.* *Samaveda* it has a vertical superscript bar (cited by Sathaye, 2015 pp 2-5).


अघमर्षणसूक्तम्

हिरण्यशृङ्गं वरुणं प्रपद्ये तीर्थं मे देहि याचितः। यन्मया भुक्तमसाधूनां पापेभ्यश्च प्रतिग्रहः। यन्मे मनसा वाचा कर्मणा वा दुष्कृतं कृतम्। तन्न इन्द्रो वरुणो बृहस्पतिः सविता च पुनन्तु पुनः पुनः। नमोऽग्नयेऽप्सुमते नम इन्द्राय नमो वरुणाय नमो वारुण्यै नमोऽद्भ्यः।।

Figure 2.21: *Rigveda Sukta* with Diacritic Marks

2.3.17 Abbreviations

Abbreviations were found used in the manuscript pages very frequently in India since the period of Kushanas and Andhra (Satavahan) e.g 'हे.'for 'हेमन्त, 'दि.' for 'दिवस' in the beginning of Christian era (Satyendra, 1978, pp. 41,117; Murthy R. S., 1996, p. 107)

2.3.18 Marginalia

Anything written in the margin area called 'marginalia'. Murthy observed that marginalia was used for writing page/folio number, titles of sections/chapters/cantos, corrections as well as meanings/explanations (Murthy R. S., 1996, p. 110).

2.3.19 Segmentation / Section/ Separation / Punctuation Marks

According to Murthy, a manuscript begins with a salutation to Ganesha and/or the favourite deity or a guru of scribe, e.g. *Sri-Ganeshay-namah*, followed by a title of the work and a title is written in the left margin. Similarly the sectional headings are placed on the left margin (Murthy R. S., 1996, p. 105).

The study of Olivelle on Kautilya's *'Arthashastra'* revealed that Kautilya referred a cluster of minimum one and maximum three words, and this collection of words makes a sentence. The writing system in ancient Indian manuscripts and inscriptions, there was no space left between the words and letters; they run throughout the line without spaces. The introduction of '*varga'* that worked as a white space is noticeable in modern times (Olivelle, 2013, pp. 119-120).

Murthy has given an example of a graphical representation of a section beginning and ending in the epic '*Ramayana'* where a sign '  is found used in the left margin where a '*sarga'* or canto begins or ends. The similar sign is used in *Bakshali* manuscript to show the end of the stanza (Murthy R. S., 1996, p. 105).

According to Murthy, in Sanskrit manuscripts only two types of vertical stroke-like punctuation marks are seen; they are single *danda*'।' and double *danda* '॥'. These *dandas* have a different meaning for variety of literature. In a text without metrical structure, i.e. prose passage in which 'single *danda'* means the end of sentence and a 'double *danda'* indicates the end of section or canto. In a text with metrical structure i.e. versified passage a 'single *danda'* means the end of first half of stanza and a 'double *danda'* is used for variety of purpose, e.g. denoting the end of the section or showing a number of stanzas '॥0॥'. In some cases, a serial number of stanzas, end of chapter/section are put in between two *dandas,* e.g. ॥५॥२॥. Here the first number reveals the order of stanza number and the second number denotes the order of a section (Murthy R. S., 1996, pp. 106,107).

According to Tripathi, the graphic marks such as '*cha* - छ', '*Shri*- श्री', rosette and sometimes space is found used between texts as a separator mark. Apart from these various graphic marks or elements were also used to denote section separators (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 18)

2.3.20 Binding Types and Techniques

Banabhatta in his '*Harshacharita'* (Bana, *Harshacharita*, p.85f, as cited in Murthy, 1997) explained how to read or handle a manuscript. For instance, just before the reading a manuscript one should untie thread around it. A low stool preferably made up of cane (*Sharashashoullaka-yantra*) should be used to keep the book on it. A bookmark is made up of a leaf and a lesser in length than a book (*antaram patram*) should be used. A few leaves can be taken in hand while reading (Murthy R. S., 1996, p. 104).

In palm-leaf and birch-bark manuscripts a cord is passed through the holes made to prevent slipping away or shuffling of leaves (Murthy R. S., 1996, p. 103).

Tripathi pointed out on an orderly arrangement of palm-leaf folios and holes for tying pages. It is found that one or two holes at equal distance pierced in the folios. If there is single hole then it was pierced in the center of the folio. In case of paper manuscripts, the holes were needless because of their fragile quality. However, the holes were continued to be part of paper manuscripts for some time and later on this practice was discontinued. The free space sometimes found encircled with decorative motifs as shown below in

Figure 2.20 or is left empty. The tradition of keeping free space was practiced by the Jainas for relatively a long period but was rarely found and used in Brahmanical manuscripts. Because of free space left for piercing area in between the text, concern arouse in continuity of the line and interruption in reading continuity, whereas lines of text are continuous above and below piercing area. Problem is more evident in some cases where width of the manuscript is very narrow and presence of the empty space for hole, the text is divided into two columns (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 25)

Palit described various forms of manuscripts, such as scrolls, book form, and codex. For outer cover or binding wooden plates made of birch or teaks are placed. Exclusive covers were made of ivory or brass, and they are found decorated with carvings, precious stones, etc.(Palit, 2010, p. xx).

2.3.21 Scribe and Scribal Errors

According to Murthy, to be a scribe is a strenuous profession who does copying of manuscript and documents correctly. Generally, scribes have declared their names along with other details in the colophon. Copyist need not compose the work. Murthy relates the work of the scribe with a modern typist or typesetter who uses a typewriter or a modern printing press. A scribe called as a compositor who composes text from author's work. In modern days after composing a text, a proof-check is done, and a text is corrected with the help of proofreader. In contrast, the manuscript writing was not the work of revision, so the could not be rectified (Murthy R. S., 1996, pp. 110,111).

Murthy and several other scholars have noticed that style of handwriting changes from person to person. This may cause visual and psychological errors while reading the copying original. According to them, a scribe's physical and mental qualities include vigilant eyes, mental calmness and ability to sit continuously for a long period. Manuscript writing is a manual reproduction of a book and it depends upon the trust worthiness of a scribe. Scribal errors can occur because of the unfamiliarity of the script to be copied. Scribes have made different types of remarks such as '*kundala*' – circle around letters, shows their inability to read character, whereas some left blank spaces. Those scribes who have left blank space considered to be honest (Murthy R. S., 1996, pp. 111,112).

According to Murthy, there are various types of corrections were found made in the manuscripts. Corrections are marked using various methods such as dot or small horizontal line put above in the place of the missed character. These insertion areas are marked with '*hansapada'* or '*kakapada'* using 'x' / '=' / '^" and a letter is added above the line. Replacement of a letter correction is written in the left or right margin area adjacent to the line or sometimes it is placed in the top or bottom margin. Yellow pigment or turmeric is painted over incorrect portion of the text (Murthy R. S., 1996, p. 109).

2.4 Overview of Manuscript Design Trends in Other Countries

While expressing a thought about manuscripts as graphic design process, Meggs and Purvis has observed that this thousand-yearlong process of manuscript designing helped in shaping rich vocabulary of graphic forms, page layouts, illustrations and lettering styles and techniques (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47)

Process of manuscript writing in England involved preparation of parchment, cutting it into size, ruling sheet with guidelines for writing a text, text writing and paining the illustrations, collected all pages together and sew them in groups, and finally binding a book between wooden boards with leather cover (Ross, 2003, p. 53).

Rose listed material used in medieval manuscript writing such as pens or quills made from bird feathers, brushes made up of animal hair, inks and paints. Gold and Silver paints were used to enhance visual aspect of manuscripts (Ross, 2003, p. 52).

Meggs and Purvis stated that in 700 BCE Charlemagne were encouraged to revive learning and arts in England. In a *turba scriptorium* (crowd of scribes) page layout, styles of writing and decoration have been reformed to prepare master copies of religious books. Later on all scribes dispersed entire Europe to spread reforms (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 50).

2.4.1 Types of manuscripts

Rose observed that during medieval period religious establishments produced most of the manuscripts. The manuscripts were produced for different purposse : Antiphonals – which contains music and words sung as a daily service in churches; Benedictional – containing blessings and prayers recited by bishops; Breviaries – daily prayers recited in ministries; Choir Books – with music and songs; Homiliaries – lessons and discussions

and scriptures; Lectionaries – selected reading; Missals –text necessary for mass; Pontifical – used by popes and bishops; Sacramentaries – containing prayers recited by the priests during mass. Along with this religious text, the manuscripts on medicine and books on animals were also produced (Ross, 2003, p. 54).

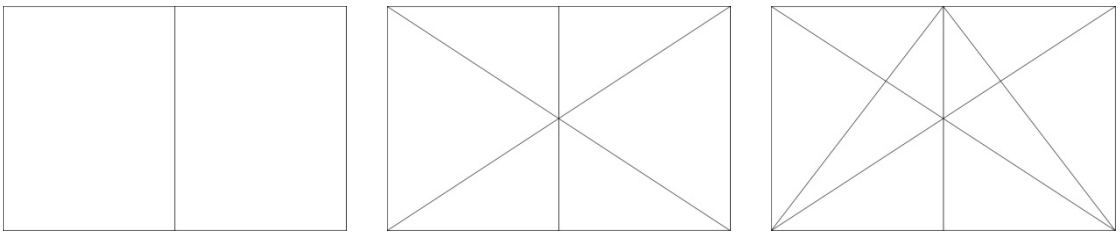
2.4.2 Layout and Composition – Grid, Structure and Form

Meggs and Purvis have observed that the form and shape of most of the manuscript were such that they could fit in the saddlebag considering its portability. This has helped in spreading knowledge from one place to other through centuries. The colophon added mostly at the end of manuscript, which usually had details and facts about manuscript (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

In the catalogue of French vernacular literature ‘Chretien de Troyes’ of late twelfth century through the third quarter of thirteenth century observations revealed that early thirteenth century manuscripts are mostly in small format, un-illustrated and contains single story. Whereas, in the second quarter of the thirteenth century, manuscripts have larger formats and contains collections of stories. Illustrated manuscripts are seen by middle of the thirteenth century. In French manuscripts theruling on page done by lead or crayon, which leaves faint, marks of line on paper. Crayon leaves light brownish marks whereas lead leaves dark, thick line marking on paper. First line is written above the ruled line. (Ruling used as a baseline grid) (Busby, Nixon, Stones, & Walters, 1993, p. 5)

Haslam has illustrated Villard de Honnecourt’s (c. 1225- c.1250) geometrical method of dividing space, which is different from Fibonacci scale. In this method page has 81 units; height divided in 9 units and width divided in 9 units. Units are used to define margins on the page.

Following is the systematic representation of thirteenth century Villard de Honnercourt’s Grid.



Step 1 **Step 2** **Step 3**

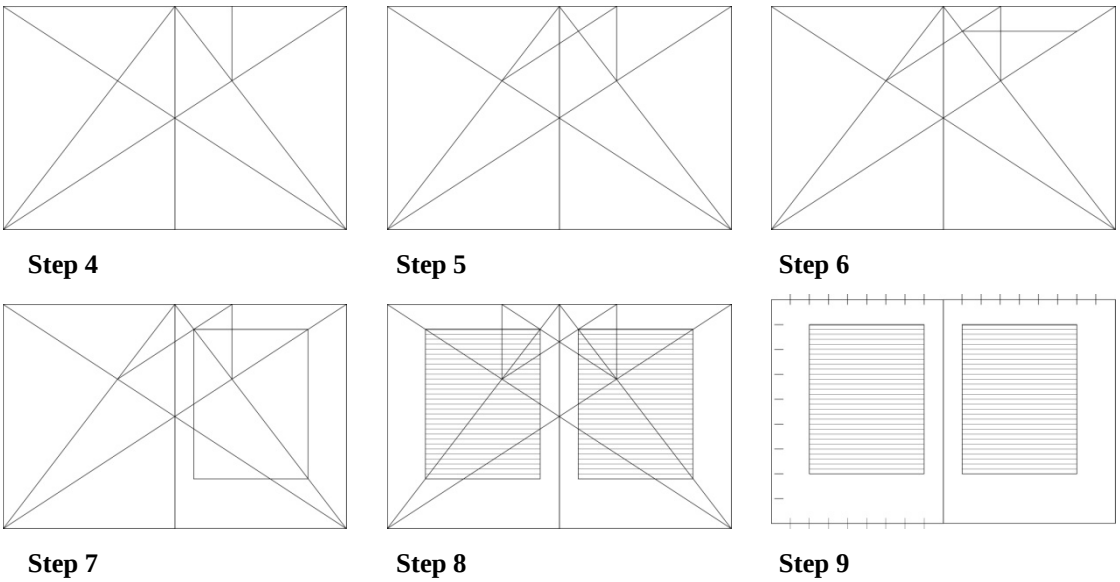


Figure 2.22: Systematic demonstration of Villard de Honnecourt Grid, 13th Century (Haslam, 2006, p. 44)

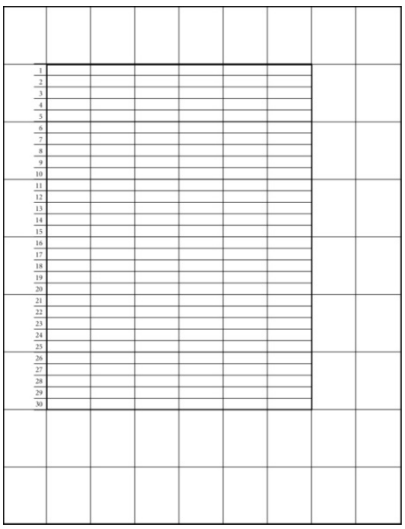


Figure 2.23: Page Division Using Geometric Construction. Villard de Honnecourt Grid (Haslam, 2006, p. 45)

2.4.3 Design Features

Rose found that though all English manuscripts were handwritten but all manuscripts devoid of decoration and illustrations. Manuscripts made for various categories of people; they were monks; students; royal members; and wealthy people (Ross, Artists of the Middle Ages, 2003, p. 54).

Meggs and Purvis discussed the peculiarity of Islamic manuscripts i.e. complex, decorative multiple frames around text and illustrations. These borders made up of arabesque floral and geometric repetitive patterns. In exclusive Islamic manuscripts,

space between the line i.e. negative areas filled with gold colour to make it concrete forms (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 61).

According to Meggs and Purvis handwritten, illustrated and decorated manuscripts are called illuminated manuscripts because of the dazzling effect of gold-leaf technology to decorate them. They were produced in Europe until 1450 in the later period a printing revolution began and the typography evoloved. Extra care and design sensitivity were the main features of these illuminated manuscripts. These books were visually embellished with patterns in gold and silver for design effects. Books had leather covers and bound between wooden boards. Scribes trained in writing text in style. Illuminators and illustrators provided visual support by ornamenting the page. *Scrittori* or a scholar used to control entire process of production including page content planning. Introduction of punctuation mark for the purpose of pause, pitch change in chants, adaptation of Arabic numerals and musical notations in the 9th century are the mile stone contribution in medieval graphic design (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

Meggs and Purvis had observed that the Egyptian manuscript designs influenced Greek and Roman manuscripts. In simple layout a technique used of inserting small crisp illustrations in text, which gives, a feel of contemporary comic book with cinematic graphic sequence (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

By third century, BCE the monastic Graphic artists started designing majestic manuscript design with expensive purple colour and the text in silver and gold. Letter styles had developed in the late antique period and early Christian period and continued until ninth century. The style is simple, fast in writing and easy in letterform, called *'Uncial'* means written between two guidelines and distance between these two guidelines was one *'uncial'*(Roman inch). The *Uncial* style actually invented by Greeks in early third century BCE (Meggs & Purvis, Preface, 2012, p. 48).

After eighth century new style of book design emerged in using of Celtic forms. Celtic designs are mainly 2D design form with geometric motifs with interlaces and lacertines. Features of Celtic patterns are: abstract, geometric liner patterns with weave, twist and filled space with thick visual texture. Celtic patterns were complex designs with pure and bright colours used in juxtaposition. An era of full page illustrations has began with full page ornamented frames and borders to enclose illustrations. The ornamented large initial used in the beginning of chapters along with full page decorative design i.e. carpet design. Graphic artist had then found challenging design problem with large initials,

which was resolved using graphic principle i.e. *diminuendo* means decreasing scale of graphic information. A novelty of Celtic manuscript design was the use of space between words to help reader in reading words quickly (Meggs & Purvis, Illuminated Manuscripts, 2012, pp. 47-49).

Sarkar has argued that in the beginning period of Muslim period there was resistance for plastic or pictorial art but the art of writing slip away from this pessimistic attitude (Sarkar J. , 2012, p. 121).

2.4.4 Calligraphy

Sarkar had found fair penmanship, elegance and beautiful calligraphic writing in most of the Arabic and Persian Manuscripts. First evidence of calligraphy is found in Hebrew script. It had distinct features like square, well-proportioned, and separate letters. Later on Arabic calligraphy evolved with influence of various cultures and enriched with good qualities of beautiful writings and forms. (Sarkar J. , 2012, p. 120)

Kiiniaja stated that evolution and application of calligraphic art developed in Indian subcontinent also. Writing was one of most important religious and cultural activity in Islam. As a result of iconic drawing, figures and pictures are forbidden in Islam skills of artist and scribes can be seen as in Islamic calligraphy. There are seven well-know calligraphic style: *Naskh* - with cursive characters and equal height and weight used for copying Quran; *Thulth* - one of the most decorative and aesthetically elegant form of Arabic calligraphy used in titles of books, first page of Quran, headings, inscriptions; *Nastaliq* - with fine and delicate terminal strokes; *Kufic* -with square and angular letters, *Riqa*, *Diwan*, and *Tugra*. Indian Islamic calligraphers introduced attractive '*Bahar'* style in 14th century with bold variety and round strokes without sharp ends (Kiiniaja, 2010, pp. 196-202)**.**

The art of fine writing was encouraged in the middle period and in the renaissance period in France. Many books and treatise are produced using calligraphic text (Illuminated Manuscripts, Glossaries).

Two major standardized scripts were used for writing manuscripts in Europe during c.800 to c.1500 AD. They were Carolingian Minuscule and Gothic script. (An introduction to Medieval scripts, 2016). Notebooks of 11th century AD e.g. mathematics books for education available at National Library of the Netherlands at Hague were not fancy. Some book forms are in the ratio of 1:0.7, some are narrow, some are broader with

no title page, or publisher details. Book available in church, displayed at alter, are written in very good script and ornamented, illuminated and decorated. (Kwakkel & Harris, Making the medieval book, 2016)

2.4.5 Initials

Minor initials were most commonly used as a form of decoration inthe thirteenth and fourteenth centuries in French manuscripts. They were mainly set at the left edge of the text margin and were of two lines in height. The variety of colours, such as red, blue, green and yellow were used in twelfth century. In thirteenth century, red and blue colour used for minor initials in alteration for different stories or only red has been used.(Busby, Nixon, Stones, & Walters, 1993).

Ross thinks images help in understanding the subject clearly. As per old saying ‘A picture is worth a thousand words’ – any visual of animal, human being or a common object can replace different vocabulary words of many languages. Images and text are two different things but are closely related. In the medieval manuscripts, alphabets were used to show pictures/illustrations in different types of initials, mainly in historiated type initials. This elaborate decoration has given life to letterforms. It is a very creative work and close association of text and images. (Ross, Language in the Visual Arts: The Interplay of Text and Imagery, 2014, pp. 5-24)

Various types of initials, e.g. miniature, historiated initials, foliate initials, gold foliate, red and blue parted initials and minor initials were used in French Manuscripts. Use of pen flourished initials, and filigree work were also done around minor initials for decorative purpose (Busby, Nixon, Stones, & Walters, 1993).

Amount and format of the illustration varies as per the purpose of the book. Enlarged decorated initials are the characteristic of Romanesque period manuscripts. Initials are huge capital letters used as section mark or at the beginning of new chapter. Initials can be defined according to their styles such as: ‘Decorative’ – geometric and foliage designs; ‘Zoomorphic’ – composed of animal forms; ‘zoo-anthropomorphic’ – combination of animal and human form; ‘Gymnastic’ – animals and human performing acrobatic stunts; ‘Inhabited’ – people and/or animals entangled in geometric and foliage patterns; and the most important category is ‘historiated’ – enlarged letters contains pictures or scenes of the text. Historiated forms were continued in further page layouts,

they are found in Gothic manuscripts. Half page, and full-page illustrations were very common in mediaeval period (Ross, 2003, p. 53).

2.4.6 Punctuation / Segmentation / Phonetic Marks

Study by Galambos on the medieval Chinese manuscripts showed that before 20th century no punctuation mark used in Chinese writing. Galambos has defined all marks or symbol used in the manuscript such as correction marks, phonetic marks, abbreviation marks, segmentation marks, repetition marks, etc. For correcting words the technique of painting wrong character was used or practices of marking a mistake with small dot on sides. Since, there was no system of punctuation marks, Chinese scribes wrote text in 'chunks' in small segments (Galambos, 2014, pp. 341-350).

Introduction of punctuation mark for the purpose of pause, pitch change in chants, adaptation of Arabic numerals and musical notations in the 9th century europen manuscripts is the mile stone contribution in medieval graphic design (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

Modern Arabic foliation was used for numbering pages. (Busby, Nixon, Stones, & Walters, 1993)

2.4.7 Binding

Pasteboard technique, Morocco leather used for binding books. (Busby, Nixon, Stones, & Walters, 1993).

Specimen manuscripts of c. 1500 AD, among which few are very small are available at the National Library of Sweden. They are prayer books and their sizes are smaller than iPhone so that they can be carried while travelling. For firm binding wooden boards were used to protect stack of quires. Limp binding was very much popular in medieval period. Pages in the form of bifolium and are bound together in the form of quires. Manuscript covered by leather, silk (Kwakkel, 2016).

2.5 Graphic Design and its Role in Communication Design

Meggs and Purvis pointed out that William Addison Dwiggins have coined the phrase 'Graphic Design' for his visual form for print media in structural order in 1922. The term 'Graphic Designer' is well accepted by design community after world war II, till then designers were known as 'Commercial Artist' (Meggs & Purvis, 2012, pp. VII, IX).

Paul Rand, a well-known graphic designer, has defined Graphic Design as "Visual Communication of any kind, whether persuasive or informative, from billboard to birth announcements. It should be seen as the embodiment of form and function: the integration of the beautiful and useful. In an advertisement copy, art, and typography is seen as a living entity; each element integrally related in harmony with the whole, and essential to the execution of the idea." (Rand, 2014).

According to Golombisky and Hagen, any graphic design has form and function but it is also related to style, trends and winds of visual culture. 'Design' is also influenced by technology. Though the design is influenced by many factors, the function of graphic design does not change. And the function is to communicate message visually hence also known as visual communication (Golombisky & Hagen, 2010, pp. 3-6).

Table 2.2: Etymology of Graphic and Design

Etymology	**Source**	**Definition**
Graphic	(Barnard, 2005)	"The word 'graphic' in graphic design derives from the ancient Greek word '*graphein'*, which meant 'mark-making'' and which covers written and drawn marks".
	(Graphic Art Design and Graphic Design, 2009)	"The word derived from the Greek word '*Graphikos'*. It stands for writing, drawing, pictorial representation".
Design	(Barnard, 2005)	"The word 'design' entered English language from the Renaissance". "French word *dessiner*, and later Italian word *desegno*, which meant drawing, planning, sketching and designing. The root is the Latin '*Signum'*, meaning a 'mark'".

Meggs and Purvis have defined the 'Graphic Design' through the historical path. Meggs documented innovations in the field and noted the contributions of designers sequentially. In the introspection carried about graphic design, they found that in Europe in the first two decades of the twentieth century there were drastic changes in human conditions because of innovations in technology. Destruction did happen during both world wars deeply affected artists minds, and eventually it influenced visual art and design field as well. It helped creative revolution to happen in the graphic language of form and visual communication. Cubism began in Paris (Key Dates: 1908-1914) which provided a new approach towards design and pictorial space by geometric abstraction of art. Futurism began in Italy (Key Dates: 1909-1944), movement experimented in

typography in visual form in publication design by adding motion, energy, rhythm, and cinematic sequences in the work resulted in animated pages with dynamic, non-linear composition. Dadaism began in France (Key Dates: 1916-1920) a conceptual art movement rejected traditional art using readymade objects by making a modest change in them e.g. montage for book cover design. Surrealism founded in Paris (Key Dates: 1920-1930) affected graphic design by adding fantasy and illusion in imagery using biomorphic forms. Expressionism influenced graphic illustration art by taking inspiration from children art, unschooled artist, tribal arts, and non-European cultures. As a result of these developments the theories about form and colour advanced, and hence creating a foundation for design and design education. All these movements helped graphic designers in the innovation of design by adding new concepts, images, and methods in organizing the visual composition. Post-Modernism (Key Dates: 1960-present) is an internationally adapted simple design style (Megges & Purvis, 2012, pp. 256-275)(Art Movements).

2.5.1 Definitions of Graphic Design

The design experts, practitioners, and academicians have created and operationally set forth numerous definitions on ‘Graphic Design’.

Barnard highlighted the historical relevance and linguistic association with ancient Greek term '*graphein*' that means depict signs, and the origin of the word 'design' derived from *'dessiner'* and *'desegno'* words from English and French languages. It means the process of producing artwork (Barnard, 2005).

Paul Rand**,** a widely known graphic designer of the twentieth century**,** strategically defined Graphic Design which, according to him**,** includes all dimensions of design (Rand, 2014).

Betala thinks that it is a branch of visual communication based on thought processing and conceptualization as well as a two-dimensional form designed bearing in mind human factors (Betala, 2005, p. 46).

Woods’s definition focuses on a successful visual communication aesthetically designed for **a** focused group with text and image (Wood, 2014).

Many scholars associated graphic design with culture and technology. Shaughnessy brings to light the association of graphic design with principles of design, use of

language, and cultural influence on design (Shaughnessy, 2005). Resnics thinks that it is a form of communication with cultural influence on design to meet the user's needs, which includes art and technology (Resnick, 2003). According to Tibor *et al*., it is a medium of communication to express thoughts. It is ubiquitous and is practiced in every culture and presented using various medium with varied technology (Tibor, Miller, & Jacobs, 2015).

Ambrose and Harris think it is a visually appealing communication created for using an amalgamation of thoughts, text and image as well as it presented by using various mediums. A meaningful and skilful arrangement of content helps in targeting audience to understand information effortlessly (Ambrose & Harris, 2008, p. 10).

2.5.2 Modern Graphic Design

Aynsley pointed out those roots of modern graphic design, which are practiced worldwide, especially in the context of publication design. As though the term 'Graphic Design' is very recent but its existence can be traced out since very long time. The cocept was used in cave paintings of France since c15,000–10,000 BC. Romans also used it for advertising. There are various mediums associated with it, e.g. print, drawing, illustrations, photography, audio-visual, film, etc. As pointed out earlier in different context, before the World War II, 'Graphic Design' was known as a 'Commercial Art'. To cater a newly industrialized society with mass circulations of visual forms such as newspaper, magazines, etc. new courses in 'Graphic Design' developed in art colleges by 1945 in Europe. Today it is a branch of 'Visual Communication' and it covers all types of design from bus ticket to dictionaries, magazine, packaging design, illustrated books, corporate designs, etc. (Aynsley, 2005).

Postmodern Design movement began during 1970s in a western world. International type design style used to emphasize important word or line. The exploratory design was practiced with established harmonious grid system. Publication designs with characteristics such as strong value contrast, clear and simple layout are seen during this period, and the designers incorporated vernacular and historic forms in their designs. Designs were not refined due to handmade process, but since the mid-1980s onwards with the introduction and innovation in digital technology, the computer-generated designs with electronic capabilities became a tool to design an artwork. With the help of digital technology, a new area has opened to the graphic designer as 'Desk Top Publishing'. It has widened the scope of graphic design field in the manipulation of

colour, typography, texture, form, space and imagery using various page making and image editing software. Digital type design has provided numerous old as well new fonts to graphic designers with stylization and variations. (Megges & Purvis, The Influence of Modern Art, 2012, pp. 475-545).

According to Vyas, a senior Indian design academician, the modern awareness of design has originated from the transformation of one concept into the other; that is, the change of design as an ability to show design as a process (Vyas, Design The Indian Context, 2000, p. 25).

2.5.3 Features of Graphic Design

Golombiskty and Hagen think that the purpose of any Graphic Design is to convey information. Controlling readers' eye movement through drawing attention and engaging them emotionally is one of the functions of Graphic Design. To achieve this function, the visuals in the form of imagery, and typography and space work as building blocks. (Golombisky & Hagen, 2010, p. 6).

According to Betala, the key features of the modern graphic design are related to innovation, keen observation, logical thinking, analytical mind, risk taking ability, problem-solving attitude, adventurous in natures-looking out for new dimensions, sensitive about the situation and the needs. It always inclined to contribute and has to understand human behaviour and psychology. Betala has classified design aspects into two main groups– the SOFT and the HARD. Thus, creativity and aesthetics of the ‘softer aspect’ and practicality and functionality of the ‘harder aspect’, make a successful design (Betala, 2005, p. 11).

Golombisky and Hagen have pointed out that graphic design is a planned activity which involves various stages such as ‘thumbnail sketches’ to define a focal point and to settle content i.e. copy (text) and visuals (images) in given space. To achieve this logical arrangement is considered. Easy in reading, handling, and visual attraction are sensitive issues of any design. Poorly designed layout does not appeal any reader; it is a failure and loss of money and time of any organization (Golombisky & Hagen, 2010, pp. 3-6).

Craig has pointed out that a graphic design and a layout of any print media are two important features of media. Craig studied ideological aspects of publication design and observed that there is an increase in visual sophistication. A modern graphic design has a huge range of possibilities, which include elements such as line art, photography, display

type, various layout styles, white space, contrast, emphasis, visual order, information graphics, grids, etc.(Craig, 1990, pp. 18-27)

Table 2.3: Semiotic method to understand Visual Code of Graphic Design by Robert Craig(Craig, 1990, pp. 18-27)

19th Century (mid century)	
Elements used	Typographic oriented graphic design.
Features	More influenced by design which existed before printing
How it is different from current design	Absence of display typography, line art, and continuous-tone
Late 19th Century	
Elements used	Decorative typestyles, iteration typestyles
1870 onwards	
Elements used	Use of line cut depicting logo and products
Features	Display headlines attract the attention of the reader. In 1880 - halftone process helped in using photographs and continuous tone images in printing. Quality was poor until the first decade of 20th century.
End of 19th Century	
Features	The new symbolic style introduced in advertising design. More white space with big type size and the illustration based publications.
Early 20th century	
Elements used	Modern publication design was in practice
Features	Innovations become conventions as design practice was codified The introduction of new graphic elements such as line art, photographs, display typography, varied layout styles, white space and variation in type size and column widths introduced. Through the new contrast meaning emphasis and significance could be indicated.
Current Design	
Elements used	Visual Code Use of display type, line art, continuous tone

2.5.4 Book Design and its Alliance with Modern Graphic Design

Haslam has stated that a book is one of the oldest forms of documentation, which has a history of 4000 years. Book provides information about world's knowledge, ideas, and

beliefs. The literal meaning of a book is: *'a board for writing'*, and the word derived from old English word *'bok'* that has a link to *'birch tree'*. The Egyptians scribes were the first book designers who used columns and illustrations in their scroll format books. The Greeks and the Romans followed design style of Egyptian scroll for writing codex, which included writing in columns. One side of a book which is acknowledged as *'page'* is derived from Latin word *'pagina'* which means *'something fastened'*, which has a connection with bookbinding The books designed by the Greek and the Romans were bounded and were called as codex. These codex- type of books broke the old tradition of writing on the scroll. In codex, parchment sheet is folded and joined one edge to other edge and then piled and bound on one side. Folding of large sheet created two folios. (Haslam, 2006, pp. 6,7). Haslam identified that though the definition of a book is available in various dictionaries, two elements are common in all these; and they can be summarized as 'portable bounded sheets used for writing literature' (Haslam, 2006, p. 8).

Roberts described a book design and its various aspects. She thinks the format of the contemporary book is similar to 'codex' books created by the Romans thousand years back, and a book design is the oldest form of 'Graphic Design'. The invention in digital and print technology gave a boost to print various types of publications. New styles and directions constantly being introduced to book design trends. Book genres such as fiction and non-fiction underwent many changes, e.g. cookbook layouts have changed from simple typographic to exciting, mouth-watering photography oriented with good typography, and less cluttered layouts (Roberts, 2004).

According to Sugiura Kohei, a book design is a task done by multiple people, which involve writers, photographers, and illustrators. A designer assembles all these components together by a single idea and form a design, and the final output is a book. This assembly is further taken ahead for printing, binding, and marketing, and finally it reaches to a reader (Kohei, A Cosmos Full of Characters, 2014).

Haslam has pointed out that a book design is a collaborative process, and it involves various team members, e.g. author/writer, illustrator, designers, photographer, editor, proofreader, reader, printer, binder, publisher, etc. (Haslam, 2006, pp. 13-18)

Ambrose & Harris have explained key considerations of publication. They stated that before presenting images and text on a page, a designer must think about the objective of publication and its readers along with page format, print-finishing specifications, etc. (Ambrose & Harris, 2011, p. 18).

Haslam has introduced an approach to a book design using four broad categories, which are common to graphic design. These categories are: documentation, analysis, concept, and expression. A book design process starts with documentation, which is fundamental to a graphic design. Documentation involves information about design brief, manuscript/text, images, a list of figures, photographs, tables, diagrams, etc. The analysis helps in structuring and ordering of content, which creates a pattern. Analysis helps in classification of various elements of content using sequence and hierarchy. The conceptual approach may involve two or more ideas to communicate a message. It may include pun, impossibility, metaphor, fable, etc. The expression is the interpretation of author's idea using visual elements such as colour, symbolism, etc. of a design. (Haslam, 2006, pp. 23-27)

According to Betala, before a designer begins with a design project, he/she has to make a detailed analytical study of the existing scenario on that particular topic. The factors such as range available, material of final product, the problems face, colour schemes, selling factor, clientele and the target audience has to be studied first. In short, in-depth study or scrutiny of the contemporary market is the very much necessary for a complete understanding of project (Betala, 2005, p. 30).

Lu Jing-ren, a graphic designer from Beijing (China), while designing books or redesigning sacred books always thoughtfully integrates traditional Chinese elements into contemporary book design and tries to revive old techniques of a book making. It gives a fresh sensation to the reader, which is a new way of combining modern elements and cultural traditions. Lu Jing-ren thinks that a book can convey exquisiteness of traditional culture. (Kohei, 2014, pp. 58-59, 61).

2.5.5 Components of Page

Ambrose & Harris have found various components of a page and their association with graphic design. They have argued that a white space around text block called 'margin'. Traditionally the inner margin is double the outer margin on the spread; but currently, the outer margin is found narrower. The top margin of the page called 'head' or 'head margin'. Traditionally head margin is half the footer margin i.e. bottom margin. 'Column' is the most basic element of a layout in which text flowed and images placed. The columns give planned look and thereby create an impressive effect for a layout. It gives static look unless variation in size is used in a text block. Space between columns is known as 'gutter' space. 'Running heads' are also commonly known as 'headers',

'running titles', etc. On every page, a text is repeated which can be a title of a publication or a chapter. Running head is mainly placed at a header area i.e. the top of the page or at the footer i.e. foot or side margin. Use of the captions for images are different from the body text by a change in a font or making it italics. Most of the time all folio numbers are placed at the bottom of the page on the outer margin or in the center of the page near inside margin. Purpose of folio numbers is to support a reader in navigating within a book pages. Depending upon the place chosen for folio number layout becomes dynamic (center of page) or harmonious (close to outside margin). Outer margin page numbers are easily noticeable while turning the page hence it adds visual weight in design (Ambrose & Harris, 2011, pp. 34,35,66).

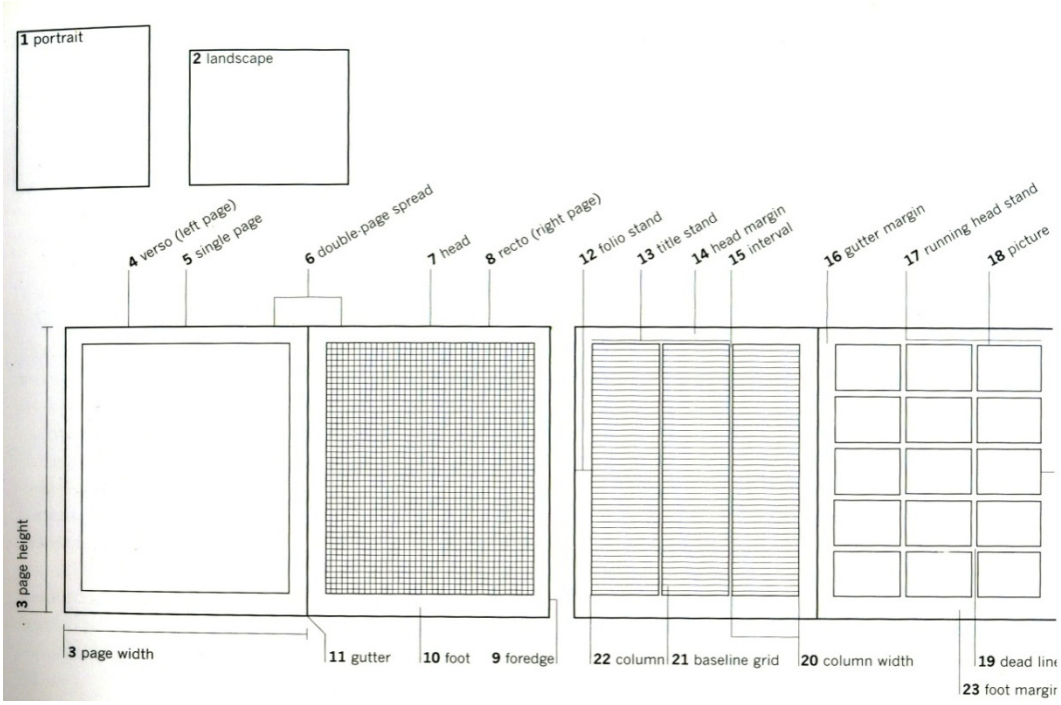


Figure 2.24: Components of a Page (Haslam, 2006, p. 20)

Haslam documented 23 components of pages and listed them as seen in Figure 2.22. Apart from these components, there are shoulder/foredge, column depth (height of column), characters per line, and gatefold/throw out (Haslam, 2006, p. 21).

2.5.6 Form and Function of Publication Design

Ambrose & Harris defined form and function of the layout in the area of publication design as: "The form that a layout of a work takes is driven by the function of the design, the ideas and information it has to communicate, the medium in which this will occur and the target audience" (Ambrose & Harris, 2011, p. 103).

Golombisky and Hagen have related a form to material and external presentation of the design. They think that the styles, trends, and innovation in technology influence visual display of design (Golombisky & Hagen, 2010, pp. 2-5).

Haslam has identified three different formats of a book design: portrait, landscape, and square. A book can be of any size and format. While choosing a format one needs to think about few aspects practically to support easy reading such as production and aesthetics. The book should be able to express author's idea through designer's angle. Haslam has further stated the relationship of the three elements with the book, namely: format, grid and layout. He further elaborated, for instance, "The format of the book determines the external proportions of the page; the grid determines the internal divisions of the page; and the layout determines the position of the elements" (Haslam, 2006, pp. 30, 42).

2.5.7 Structure of Page Layout using Columns and Grids

Seddon has pointed out that basic horizontal and vertical division of a page is done by using grid. A page further can be divided into margins, columns, gutter space and space between text and image. They form modules and finally create a systematic approach to the process of design. (Tonny Seddon, 2011, pp. 10-11)

Sherin thinks that use of simple grid makes the composition cohesive. She further adds that grid help in making template that gives the designer an opportunity to bring consistency in placing content at similar locations in a long document. This visual repetition makes easy for the reader to find information (Sherin, 2013).

Tondreau has explained numerous types of page layout grids using fundamental of a design. Grids help in placing content on the page and provide order of information. Tondreau described various type of grids namely, single column grid: look like as a block of text. The two-column grid provides flexibility in placement of elements symmetrically as well asymmetrically. Multiple column grids are more flexible than two-column grid and preferably used in magazines. Modular grid is convenient for arranging complex elements on the page using chunking of information. The hierarchical grid is made up of horizontal columns (Tondreau, Layout Essentials, 2009, p. 11).

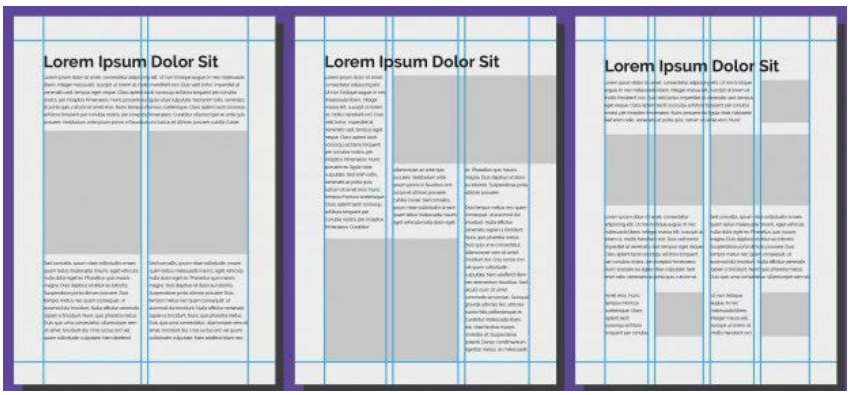


Figure 2.25: Grid and Composition of Text and Images.(Stribley, 20 Design Rules You Should Never Break, 2015).

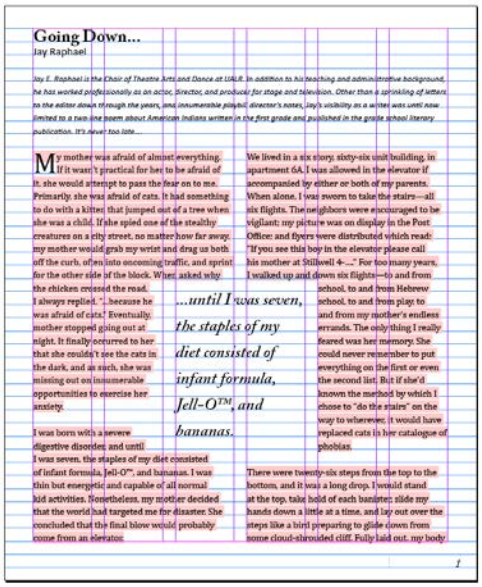


Figure 2.26: Text Composition using Baseline Grid (Quills and Pixels).

Ambrose and Harris have elaborate baseline grid such as, “The baseline grid is the graphic foundation upon which a design is constructed. It serves a similar supporting role as the scaffolding does in building construction”. Baseline grid helps arranging content on the page accurately. Cross alignment, a technique also practiced to align text with different sizes, e.g. heading, sub-heading, body copy etc. They further consider that the columns or module-based grids are a significant design tool. A designer commonly develops a flexible grid to arrange visual content (Ambrose & Harris, 2011, pp. 54, 55).

Ambrose and Harris think that a grid helps the designer in deciding the position of elements with accuracy with respect to measurements or proportion of the place. A grid can be complex which provide a number of possibilities for positioning content. It helps a designer to accomplish a great job with the coherent design. Grids can be symmetrical or asymmetrical. The symmetrical grid gives balanced look for the page or spread. It is a

continuous flow of text but can be uninteresting because of lack of variations. In symmetrical page layouts, recto and verso pages of spread are reflections of each other, whereas in asymmetrical page layouts recto and verso pages are same. The asymmetrical grid helps in breaking formal structure by creating a difference (Ambrose & Harris, 2011, pp. 26-27, 44-45).

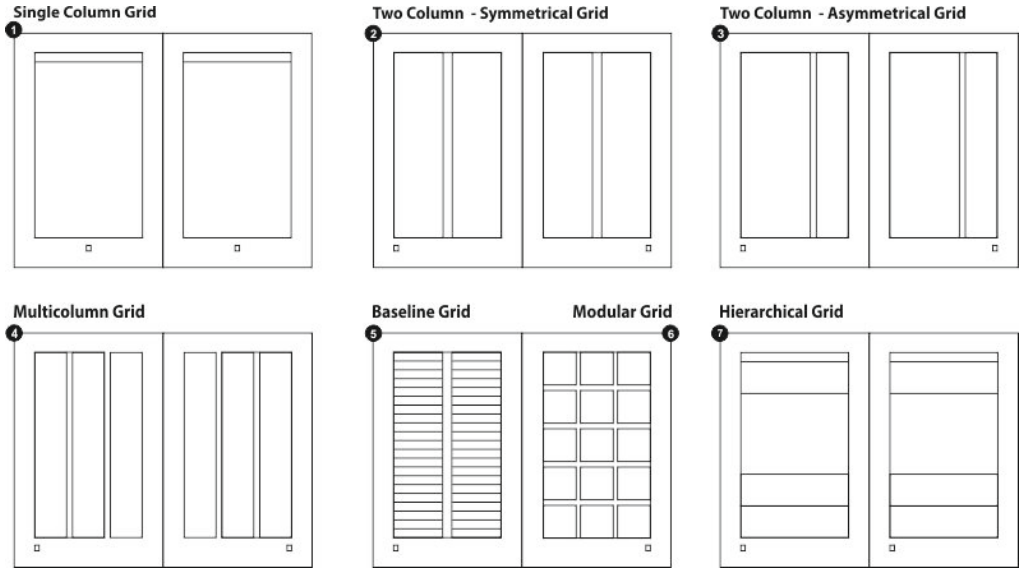


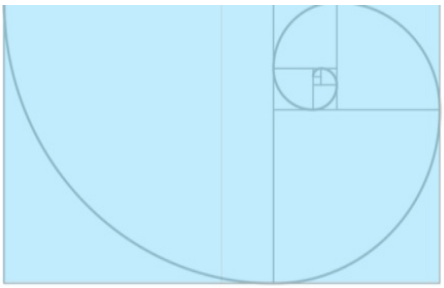
Figure 2.27: Various Grids Types (1-7) — Visual Representation, Modern Publication Designs. (Tondreau, Layout Essentials, 2009, p. 11), (Haslam, 2006, p. 56)

Haslam has observed that various types of grids are used by designers from ancient times. The grids based on geometric construction were used in the early printed books in the fifteenth and sixteenth century in Europe, when there was no standard and accurate measuring system. They used golden section using Fibonacci sequence, Bringhurst's chromatic scale, Le Corbusier's modular grid, Van de Graff cannon, etc. There is another way of page formatting by making simple divisions of space on existing page using international formats such as (i) DIN (Deutsches Institut fur Normaung) or; (ii) ISO (International Organization for Standardization) formats. Division of A0 type paper can be: half of A0 is A1, half of A1 is A2 and so on. Haslam considers that the grids can be used to achieve consistency and coherent form in a book designing. A study of Jan Tschichold found that the books printed in western countries used golden section grid format (Haslam, 2006, pp. 30-33, 42).

Ambrose and Harris indicate that in the field of graphic arts, the golden section is used in artwork sizes. With the help of this principle, visually pleasing balance is achieved in the design. The golden section is practiced since ancient times to the present with beautiful

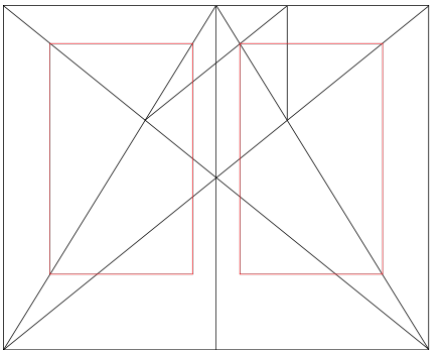
proportions, comparable to nature. Fibonacci series numbers are harmonious proportions, and are used very frequently in defining a grid, font sizes and text block placements (Ambrose & Harris, 2011, p. 24).

A. Golden Section Grid





B. Van De Graff Grid





C. Tschichold's Golden Canon

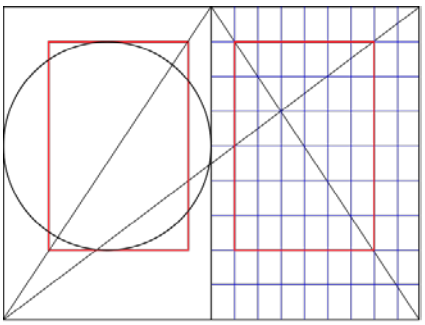




Figure 2.28: Various Grid Types (A, B, C) and Representative Sample Layouts

A. Golden Ratio in Page Layout, (Enhance Your Yearbook Page Layouts with the Golden Ratio, 2015)

B. Van de Graaf Cannon, Courtesy retinart.net

C. Tschichold's Golden Canon of Page Construction, Courtesy British Library MS 27210, Hebrew Manuscript

2.5.8 Layouts and Compositions of Publication Designs

While expressing thoughts on ‘Composition and Graphic Design’, Stribley suggests that even though the most beautiful graphic element, if not composed very well, goes unnoticed or overlooked. The composition is a cohesive arrangement of various elements, such as text, images, graphics and colours to form a design. She further reveals that a good composition is functional and effective with a variety of arrangement, distribution, and alignments of elements. She suggested ten tips and tricks for mastering composition. These ten tips are nothing but the application principles of design in a composition. They include focal point by scaling object and use of white space around focal point. Adding contrast within elements help in providing leads to user’s eyes. Visual hierarchy creates order of information. Balance in elements, employment of complementary colour schemes, consistency in layout create an impression of cohesive design. Aligning elements and making a strong logical order for reading, using grid or 'Rule of Third' create motion and interest in design (Stribley, 2015).

David Dabner believes that “Composition means a visual structure and organization of elements within a design. Composition involves seeing the whole as greater than its parts and just as important as the individual elements that make up design (text, images, etc.)” (David Dabner, 2010, p. 34).

Riordan and Pauley put across the association of line length and a number of characters with a width of the column and its effect on a page design (Riordan & Pauley, 2004).

Ambrose & Harris express that “A layout is an arrangement of elements of a design in relation to the space that they occupy and in accordance with an overall aesthetic scheme. This could also be called the management of form and space”. It is often assumed as a placement of content on a given space, which has a relationship with measurements, grid, visual order or order of information. In some compositions, a focus is on images and typography. This skill helps a reader to engage, entertain and guide order of preference. They have discussed classically balanced page layout using centralized elements to provide visual consistency and harmony. They further observed that centralized characteristic theme is used in many layouts for placement of images and other content (Ambrose & Harris, Basic Design 02 Layout, 2011, pp. 8-10, 20, 90-91).

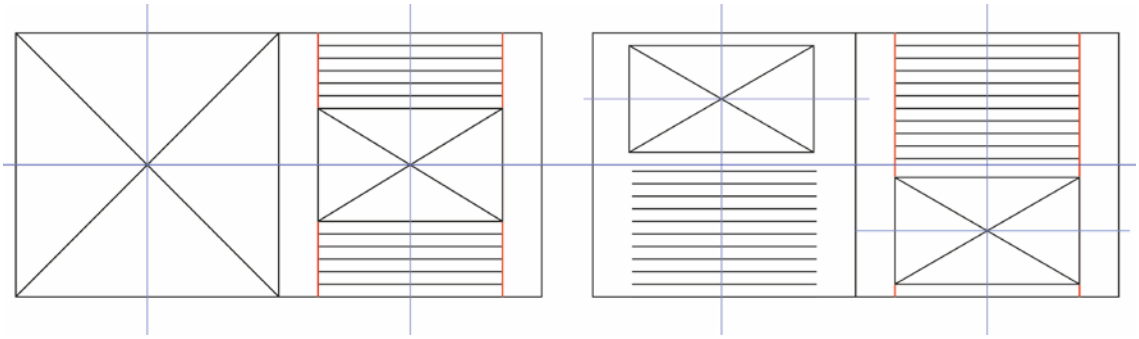


Figure 2.29: Example of Centralized Layouts of spreads

They have described page as ‘space’ and a purpose of page layout is presentable layout for images and text composition. The layout can be structured or unstructured. They suggested that while designing effective publication design the purpose of publication must be considered along with the reader. They further add that format and binding methods are the key considerations for the same. The format is decided accordingly depending upon the type of publication and how it will be read,. The space occupied by various elements on the page and surrounding can have a remarkable impact on the design. If space is less crowded due to low intensity, in that case elements on the page have better visibility. (Ambrose & Harris, 2011, pp. 18-19, 144)

According to Ambrose and Harris, a folio of any book has different elements such as column based grid, columns, headers, captions, folio numbers, head margin, bottom margin, hierarchy, images, etc. Symmetrical, asymmetrical, and modular type of grids are very popular for planning publication design layout. When text flows within the column area, it looks organized. Columns give static look for a design. Within header area, a repeated text matter such as the title of the publication or section can be placed. Folio number is also often placed in this header area. Footer area is the bottom margin of the page. Many a times folio numbers are placed towards the outer edge of the page that create a dynamic look for layout. Footer area is chosen for folio number because it is more noticeable while turning a page, and further adds visual weight to the layout (Ambrose & Harris, 2011, pp. 34-35).

According to Betala, a composition is an abstract arrangement of one or more elements in a given space so as to make it visually appealing. The arrangement is such that it creates a feeling of balance (without making it symmetrical) and harmony, and yet there is space left for visual relief. This balance could be attained both by size of the elements and intensity or depth of the tone. For making a composition visually appealing, there should be a focal point, variety in the sizes of elements and finally absence of parallel

lines and overcrowd. The main factor however remains, that is, visual pleasure though it does not serve any practical purpose (Betala, 2005, p. 74).

Serafini's opinion about composition is: an arrangement and placement of visual content considering their level of importance. Serafinin had suggested three compositional techniques, which graphic designer employ in their design, they are: 1) size of the object, 2) colour and contrast and, 3) foregrounding and focus (Serafini, 2011, p. 346).

Entry point is the key visual aid, which guides a reader in deciding where to begin with. Use of different colour other than body copy, change in point size and font are a few among various techniques applied to introduce entry points in layout. These techniques are, e.g headings are bigger than body copy and generally use of eye movement tracking software helps in knowing how reader scans through page. 'F' pattern is usually followed to read information, which begins from top left corner to right. Modules helps in placing content, and some modules are more active than the other (Ambrose & Harris, 2011, pp. 94-95).

Elements on page determine the speed of reading or visual study. It is referred as 'Pace'. Designer can control the pace with different graphic devices such as, adding strong graphic statement or adding colour block, etc. Research has shown that the large size text blocks are meant for just to scan through the matter. They act as entry point, and their purpose is to direct a reader, but a smaller type text encourages reading. It is a challenge for a designer while designing a series of pages that a reader should not be disinterested with a monotonous design against this the use of variety of elements may result in achieving overall unity in the layout (Ambrose & Harris, 2011, pp. 98-99).

Page can be divided horizontally or vertically. Vertical blocks promote reader to stop, whereas horizontal division helps in moving eye from left to right, and encourages to turn the page (Ambrose & Harris, 2011, pp. 140-141).

2.5.9 Orientation of Elements on Page

Orientation of elements on a page means the direction in which contents is placed on a page. Generally, in books, newspapers and all printed material the text and images placed in such a manner that they can be readable, and seen horizontally from left to right. Whereas, vertical orientation creates contrast and it is used for headings or for informal text. Such type of arrangement is also used in diagonal type with combinations of 45^0 or

30^0& 60^0. Weimar, founder of Bauhaus movement in 1919, applied 30 and 60-degree axis. His approach inspired many designers (Ambrose & Harris, 2011, pp. 132-133).

2.5.10 Navigation System in Publication Design

Haslam listed out items related to navigation system of any publication. It includes 'Contents' which is a checklist of articles within a book with page numbers. 'Page Number' which generally begins with chapter one, but in the old system adding of Roman numerals to the first few pages is still in practice today. 'Chapter Opener' works as a section separator for a new chapter. 'Running Heads' are placed at the top or bottom margin. 'Hierarchy of Headings' is created by making change in size and weight of headings. 'Annotations' and 'Captions' for figures, photographs, illustrations, and maps are included in the publication. 'Labels' for diagrams, 'Footnotes' placed at the bottom of a page, 'Colophon' in the beginning before half-title page stating information of author, publisher, editor, date, etc. are parts of publication design. 'Glossary' of technical terms is found in non-fiction books. 'Index' is a list of keywords with their folio numbers (Haslam, 2006, pp. 102-109).

Chisnell has observed that for easy scanning and reading a document, navigational aids such as headers and footers, headings, page numbering, table of contents along with other navigational aids are used while designing a page. These aids help a reader in finding out new information. (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 58)

2.5.11 Typography and Publication Design

Spiekemann and Ginger have define in his work that “Typography is not an art for the chosen few, but a powerful tool for anyone who has something to say and needs to say it in print or screen”. His opinion regarding selecting an appropriate type from thousand typefaces is a confusing process to everyone including practiced professionals. They further explain the use of typography for various industries, e.g. every newspaper uses different typefaces. They are small but easier to read. Headlines of newspaper guide us through the stories. Typefaces give a look and personality to the newspapers. In food packaging design, we recognize different flavours with colour and particular typeface. Sometimes hand lettering is also used in food packaging. For business communication, the typefaces with technical constraints are used; they can be used on screen, and output can be used to take production at low resolution. Tall typefaces with wide space sometimes, mono space for labels, for signage system lean, legible, geometric types are used (Spiekermann & Ginger, 2003).

Ambros and Harris have described various aspects of contemporary typography. They think accents are very common in many languages, which point out the change in pronunciation. Horizontal position of text called alignment. Type selected in a design should be readable, and it is designer's choice to select engaging and readable type (Ambrose & Harris, The Visual Dictionary of Typography : Visual Dictionaries, 2010, pp. 20-24).

2.5.12 Typography –Visual Hierarchy and Line Length

Ellen Lupton, a renowned graphic designer teacher and author of many books on design, states that in a complex page design of newspaper or magazine every element has a purpose or a function. Every reader has their own style of reading; few prefer to look at a picture first; some look at maps, charts and graphs, which are a representation of a complex data. Designer can bring a variety in the layout by using single type family and by using different weights styles. Weights can be from light to heavy. This helps reader to find out the content they want (Lupton, 2012).



Figure 2.30: Typography and Visual Hierarchy (Indesign Tutorial #3 – Interview Article, 2010)

Ambrose & Harris have defined hierarchy as a differentiation shown in typographic style as per importance of level. It can be shown using different font style, size, colour, etc. These typographic styles also serve the purpose of entry point in a document. (Ambrose & Harris, 2011, p. 94)

While explaining how to achieve typographic visual hierarchy, Ambros and Harris have suggested the use of different typefaces in combination by understanding how fonts harmonize each other on a page. Instead of choosing similar type of family fonts, a

designer can select bold *sans serif* fonts for headlines, and *serif* for body copy (Ambrose & Harris, The Visual Dictionary of Typography : Visual Dictionaries, 2010).

Deer argues if a type is used in conventional ways it increases readability and helps reader in proper understanding the content. Most of the typographic rules promote readability, and it succeeds through cultural traditions. Currently, there are plenty of fonts available to download from the internet. In spite of their structural form, legibility and consistency they also express emotions. Fonts should be carefully used in expressive typography. Typefaces used in a graphic design create 'Visual Correspondence' by creating association with phenomenon, times, and cultural correspondence. Addition of 'Visual Rhythm' also gives dynamic effect to a graphic design composition by repetition, overlap, movement, spacing, gravity and contrast. (Deer, 2006, p. 310)

According to Chisnell, one of the elements of a page layout design is typography that includes font, font size, leading, line length as well as text alignments and techniques for emphasizing. In a page design, one should use legible font with variations in headings and captions, which should be used consistently. There should be appropriate leading between the lines (1 to 4 points), reasonable line-length (8 to 9 words per line), bold and italics letters can be used to show emphasis or to highlight important information. Testing of a design is very important to know whether people can encourage doing the task (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 60).

Haslam suggests that according to the type of publication the type size should be chosen, e.g. considering adults who read novel type size is set between 8.5-10.5 pt to enable smooth reading experience to the reader (with black colour text on white background). Mostly in a book design, consistency in type size is seen, but change in type size, and weight help in creating visual hierarchy in layout. Tonal value of type, thickness of type, and colour also support visual hierarchy (Haslam, 2006, pp. 86-92).

According to Arntson, the selection of type for any layout is related to six areas, they are: type size, line-length, type style, leading, spacing and format. In consideration of the user selection, a type size is also important. 10 point or smaller point is difficult to read by elderly person, similarly long lines are difficult to read causing difficulty to reader's eye movement. It becomes more difficult with less leading space. Standard line length can be of 50 to 70 characters with legible type or line-length can be double the point size of the type. It is suitable to have more leading in longer line.(Arntson, pp. 106-108).

Ambrose & Harris brought to the notice that if there are more than 60 characters per line then it can be difficult to read a text in single column type grid. It is also difficult for eyes to find or look out next line while reading (Ambrose & Harris, 2011, pp. 30-31).

Haslam has provided rightful information of reading patterns, which are varied according to the publication type, e.g. novel and newspaper-reading pattern. Many books have 40 lines per column; newspaper columns are 96 lines deep, dictionaries 68 lines, thesauruses 70 lines, and telephone dictionaries 132 lines. Non-fiction books may have long columns, and to break the reading experience a small paragraphs is added in between subheadings. Line length is associated with the width of column. Haslam thinks that for continuous reading the best possible line length should be 65 characters. However, they can be between 45-75 characters. Twelve words per column is used in non-technical English literature. Hyphenation causes break to the word that do not fit completely in line without meaning, words but more number of breaks can create distraction in reading. Designer needs to consider hyphenation in justified text alignment, or else they may face problem of extra space between words leading to form rivers of white space with text (Haslam, 2006, pp. 71-81).

2.5.13 Role of Letter Spacing and Word Spacing

Space between letters plays important role, and it creates figure and ground relationship between text and background. If there is too much space between characters then the eye moves between empty space and characters while reading resulting in strenuous experience for the reader. (Arntson, pp. 110-111)

2.5.14 Use of Paragraphs

According to Haslam, the paragraphs are linked up with line breaks, paragraph pilcrow, indent, hanging indents or extend, run-on with symbols and drop lines. Line breaks means breaking the text, and it needs more paper, and a paragraph means dividing concepts in small, readable passages to help reader to comprehend it. Paragraph pilcrow a graphic symbol, used in ancient Greek literature as a bullet signs in front of the paragraphs. Nowadays indents or hanging indent are used to demonstrate a new paragraph. In drop lines, a new paragraph begins where the last line ended. (Haslam, 2006, pp. 72-74)

2.5.15 White Space and Compositions

Sherins understanding of white space in the layout is that it reduces clutter and helps in highlighting the contents as well as it provides visual pause (Sherin, 2013).

According to Jacci, a white space is one of the important principles of a design. White space means a blank space. Function of the white space is to provide breathing room to the layout and make is less cramped, clear and awesome. White space can be introduced in any layout by indent, by increase space between two lines, paragraph spacing, space between columns, liberal margin space, space around images, and space between headline and subheads (Bear, White Space: How to Add White Space to a Page Layout, 2013, p. 1).



Figure 2.31: White Space in Layout (rafaelhdesigns)

Garcia thinks that a white space around the text in margin area can be symmetrical or asymmetrical. It helps in creating contrast between text, copy and photographs. It helps a reader move his eye direction. It is the most important graphic element in design. In text based layouts, blocking with white space technique used to push the text. In this technique an empty space is being added at one end of page. Special strategy to use maximum space is by addition of indent to a paragraph. White space should be used effectively by adding it more outside the content than inside. And finally lack of white space in layout can give destructive effect to design (Garcia, 1987, pp. 101-102).

Ambrose & Harris suggest that the components of a page should be effectively communicative. There should be focal point and position of elements, e.g. text and image should be placed in such a way that it should form seamless presentation. A designer should seriously consider free space around the text and image. Many designers do not leave white space in a design, and as a result, it creates chaotic effect. When white space

is used in a design, it generates soothing and tranquil effect on the readers' mind. Generally, publication designs have clear chapter break points (Ambrose & Harris, 2011, pp. 65,90).

2.5.16 Grouping and Chunking of Data

Ambrose & Harris put forward that a book is a collection of related and uniform pages, but there is a need to divide it or chunk the information/data to create pace. The common methods of dividing information are: (i) to add physical page as a section divider; (ii) to add repetitive motifs or image placements at the end of chapter; (iii) by adding breaks and pauses; (iv) by changing orientation of text, etc. (Ambrose & Harris, 2011, pp. 104-105).

As pointed out by Kraus, a visual grouping of certain elements is noticeable because of extra space between other group elements. A reader first looks at the group then individual element from the group. The grouping of elements makes it easy for a reader to relate information with each other (Krause, 2004, pp. 41-43).

2.5.17 Alignment and Balancing of Content

Alignment can be vertical or horizontal, and it is associated with a position of text inside the text block (Ambrose & Harris, 2011, p. 76). In digital composing, especially in the justified alignment, i.e. flush left and flush right a computer adds extra space between words to make lines even (Arntson, p. 111).

Haslam described four basic alignments in a text. These alignments are: left, right, center and justified. In left align type, a text is aligned to left margin and as a result right side looks imbalance. The right margin can create disorder in reading text since text ragged on left side and aligned to a right margin. Whereas a center alignment used for titles. In this type, a text is balanced on both the sides of axis of text block. In justified type of alignment, a text is balanced symmetrically on both the sides of margin. This is the oldest method of alignment for a book-text. Apart from these, tapering center, a forced justified type of alignments also are in use (Haslam, 2006, pp. 76-77).

Kraus suggest that the alignment between various elements placed on a page provide structural framework to the layout. It helps in creating a sense of unity among the elements and the layout looks aesthetically correct. In structured layouts, various types of alignments are applied to elements to accomplish formal or informal look (Krause, 2004, pp. 79-90).

Graham believes that it is important to group information logically, and place the content on a page using principles of design, such as balance and alignment. This help in adding a pleasing order in layout. Alignment of elements connects them visually. It gives organized and balanced feel to the layout (Graham, 2012, p. 13).

2.5.18 Colour an Influential Tool in Composition

Sherin summarized choice of colour and compositions. Sherrin has described it as the most influential tool for any designer. It helps in structuring project and creating emphasis and a mood. It holds viewer's attention. It is an important factor of compositional balance. Lightness and darkness of colour add visual hierarchy and emphasis in composition. To bring higher contrast in the composition there should be clear differentiation between the colour values used for the elements. Modern designers use colour wheel and models for colour combinations in their designs(Sherin, Communicating with Colour, 2012).

According to David Dabner ,"Colour is a powerful tool, especially in information design; it is used to help the designer organize data into various structures. The psychologists have proved that the colour of an object captures the attention of the reader first and then its shape and other components follow it. Catalogues and books often have different colour coded sections to help navigation through pages. Such visual associations can help to delineate sections within a body of text, and highlight a number of different levels of importance. It is observed that the eye picks up this difference very quickly" (David Dabner, 2010, p. 100).

The scholars like Lindwell, Holden and Butler suggest that the limited colour palette help in understanding information quickly. Increases in number of colours add complexity in design. Since saturated colours attract more attention, it adds dynamism in layout and eye catching effect (William Lidwell, 2003).

2.5.19 Visual Appeal through Imagery

While expressing thoughts on history and contemporary aspect of images, Sherin noticed that in cave paintings, the images were used as a communication medium, which narrates stories, but there is ambiguity. As against this in modern times, the images reveal direct meaning instantly. A designer should consider images as a key component of design projects; appropriate image helps in producing interest and desired response from the reader whereas inappropriate image can ruin the entire campaign. Images have a power

to convince, resist, motivate, and give delight. Images help in enhancing content. It is challenge to a designer to communicate mood and style through hand drawn images. Images used in composition to create pattern using scale, proximity, rhythm, cropping and placement. Distance between images shows proximity and scale shows relative importance. Scaling also creates contrast in design and manages to create tension. Images in text-heavy layout work as storytelling material thus help in keeping continuity. Bleeding images placed until the edge of paper create engaging experience (Sherin, 2013, pp. 10-15).

Ambrose & Harris consider that images as one of the elements of graphic design bring life to design. They establish a visual identity for an artwork and play important role in communicating message. The images are placed using principles of layout; they create harmony with other elements. Images add drama and emotions to the layout. Images generally placed using '*Passe partout*' technique. i.e. border or white space around the design element. This effect helps in establishing focal point to the design element. Images can also be placed next to each other using 'juxtaposition' method. There may be similarity or dissimilarity between the images or elements. Images can help in determining focal point of the composition and control the order of reading. To achieve end results a designer also need to place the image using some design principles such as emphasis, colour, and scale (Ambrose & Harris, 2011, pp. 70,123,156,162).

Jacci argues on using clip art in layout. He claims that the clip arts are wonderful and they add fun factor. Clip art also contributes excitement to the layout of newsletter or poster, but too many pictures will not help reader to concentrate on a document. Clip art, illustration or images should be used in moderate proportion, which support text (Bear, Use Less Clip Art: Desktop Publishing Rules of Image Usage, 2013, p. 2).

Chisnell *et al* found that the readers like all sorts of graphics such as photographs, illustrations, line drawings, flowcharts, tables, screenshots, icons and images along with text. Graphics help readers in understanding what they read. It is necessary that graphics should be placed near, next to or immediately after text to show their relationship. Graphics can be used for different purposes such as illustrate task and show their relationship between texts. Captions, labels, arrows, callouts are added to draw attention of graphic and to understand its relevance (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 49).

Ambrose & Harris suggested that while placing images in layout, usually it should be placed at x-height and base of the nearest line of text block. This brings harmony in a layout. Nowadays images are also placed at the edge of paper with bleed (Ambrose & Harris, 2011, p. 35).

2.5.20 Appropriation

Ambrose & Harris reported that graphic design could be impacted by art or culture or style of layout; it can be borrowed by some other design. Reason behind copying style may depend upon presenting the information in particular manner for aesthetic reason. Taking inspiration from other design is called 'appropriation' (Gavin Ambrose, Basics Design 02: Layout: Second Edition, 2011, p. 109).

2.5.21 Consistency and Visual Harmony in Layout

Krause suggests that visual harmony in a layout means systematic and aesthetic association of elements on page. Consistency in colour, style, effects, theme and repetition of elements, e.g. symbols, lines, shape, etc. leads towards visual harmony in page layout (Krause, 2004).

Graham pointed out that to bring consistent and united look in design, the repetition principle of design applied in layout. Visual elements such as line, texture, colour, shapes, images, etc. should be repeated meticulously to avoid cluttered look in design (Graham, 2012, p. 13).

2.5.22 Size Relationship

Graham strongly believes that emphasizing of the key element in design is achieved by making it big in size compared to other elements. This helps in attracting the reader’s attention. Principles of design such as emphasis and contrast work together as a result provide different look to the content and add variety in layout by showing visual difference (Graham, 2012, p. 12).

2.5.23 Compositional flow

Rhythmic pattern is built through the repetitive compositional flow of text in horizontal line. (http://www.smashingmagazine.com/2015/04/design-principles-compositional-flow-and-rhythm/)

Graham states that a flow is the visual path which a reader follows. Focused arrangement of elements in a design help in controlling readers scan path to access information (Graham, 2012, pp. 13-14).

2.6 Use of Technology in Publication Design

Noble assumes the most recent, and probably the most noteworthy progress in the field of contemporary graphic design is noticed after the arrival of the Apple Macintosh computer (in 1984). It has brought a new electronic, digital environment and language in the field of graphic design. Earlier to this, all processes were mechanical (Ian Noble, 2005).

Meggs and Purvis aptly stated that the digital innovation that happened in the late twentieth and early twenty-first century that transformed the entire Graphic Design industry. Introduction of typesetting and image processing softwares expanded scope in creative graphic design. Because of desktop publishing technology handling of the type, colour, form, space, columns and images, etc. and their alteration became very easy. It also produces effective designs in less time. Introduction of typesetting softwares radically changed editorial designs. Font design software made available numerous new typefaces with various styles and attributes. Recently, many font designers developed interest in digitization of preceeding centuries handwritten calligraphic font families. (Purvis, 2012, pp. 530-565)

Tondreau suggested profusely about page making process. In this process, lots of planning is involved at various stages. First, the designer needs to assess the material, e.g. elements such as running text, section heading, subheads, hierarchy of information, charts, tables, necessity of photography. The second aspect is related to production specifications, e.g. production media (print or online), paper quality and type, printing in mono or multicolours, total number of printing pages.The third aspect is determining a format, margins, right kind of typography, leading, font size, and word/paragraph spacing. Design testing is also essential part, which is done on trial and error basis. Designer must know typographic rules also, such as hyphenation, em dash, en dash, widows, orphans, use of quotation marks, spell-checker etc. Finally, designer needs to make a package for printer, which includes linked / embedded images, fonts in document (Tondreau, 2009).

2.6.1 Use of Master Pages, Templates, and Paragraph Style in Publication Design

Frost described prominent features of publication design software (QuarkXpress and Adobe InDesign), which provides ease in designing and it saves time. These features are defining master pages, creating templates and applying styles to characters and paragraphs. Master pages used for placing content, which are common to all pages, e.g. header, footer. Generally, this information is related to page numbers, title of publication or chapter, logo, and other design elements. While defining template of any documents the designer always consider paper size and margin area first. Inside margin area, i.e. working space is further divided into number of columns. Space between the columns is also defined. A page layout can be different for left and right pages. Style sheets are applied to paragraphs and characters for standardizing various attributes e.g. font, size, leading, alignment, kerning, etc. Style sheets are defined along with the template. These pre-defined styles are applied to various type of text, which appears several times in the document, e.g. heading, sub-heading, body text, captions, etc. House style of any publication design is planned with the help of master pages, templates and style sheets (Frost, 2012, pp. 79-82).

According to Alistair & Dabbs paragraph style has all font attribute related information. Changing the format of attribute in entire documents become very easy and can be done quickly if the paragraphs are already given predefined style (Alistair Dabbs, 2005).

2.7 Summary of Literature Review

Researcher identified following research gaps through literature review:

- Previous studies in the area of layout and composition design of the seventeenth century Brahmanical Devanagari manuscripts, have not taken into account with the perspective of ‘Publication Design’ a specialized area for book design under ‘Graphic Design’.
- There is lack of case studies focusing the seventeenth century Devanagari Brahmanical manuscripts.
- There is a dearth of sufficient literature on the seventeenth century manuscript design.
- It is observed that, the earlier study that has been conducted provided a scope to take complete overview of the seventeenth century Devanagari Brahmanical manuscripts and their design aspects with contemporary modern graphic design.

In-depth discussion regarding manuscriptology in India and graphic design with focused study of design aspects practiced in publication design, made the researcher realize that there shall be still a wide scope to compare contemporary design aspects with the seventeenth century Devanagari Brahmanical manuscripts to understand history of book design in India. Hence, the researcher has chosen this topic namely ‘Composition and Layout Design of Seventeenth Century Devanagari Manuscripts in Maharashtra and Modern Graphic Design: Comparative Study of Design Concepts’ for the Doctoral research.



Chapter 3

Research Methodology

3.1 Introduction

Research Methodology comprises of research methods and various steps undertaken while conducting a research. The researcher has followed 'Grounded Theory' method (Strauss, *et al*. 1998) for the study. In this method, data is collected systematically and analyzed through the research process. In this type of research, a researcher does not begin a project with a preconceived theory in mind; instead, a researcher begins with an area of the study and allows the theory to emanate from the data.

Research broadly classified into two categories: the first, review of the literature and the second, a collection of primary and secondary data. The exhaustive literature review of latent and latest literature involved books, journals, online sources, reports, unpublished Ph.D. thesis, etc. Evidence is collected from primary and secondary sources utilized for constructing research argument. Information related to handwritten manuscripts has been collected from various libraries and online sources. These mainly include Devanagari Brahmanical manuscripts from India, manuscript design culture from other countries as well as modern theory and practices of Graphic and Publication Design. The theoretical approaches of manuscriptology were explored based on the Indian approach as well as approach of other countries that is the national and the international approach.

In brief, a theoretical framework has been constructed in understanding various aspects related to the literature review. Most of the literature in the review has enhanced the scope of the present study to investigate various aspects related to manuscripts design culture in India. It also provides insights into their design process as a visual communication product in detail. Modern publication design process and the use of design fundamentals in it are examined.

The present study initiated in the direction of the field of the process of handmade book design in India during the seventeenth century and their design concepts. The focus is to know more about layout and composition of Devanagari Brahmanical manuscripts of the seventeenth century available in Maharashtra. The attempt is made to know more about handwritten manuscripts, mainly in the area of publication design. As the graphic design subject encompasses a large variety of specialization, the developments in the field of modern publication design are considered for the study.

The review of previous studies related to Indian manuscripts and their design process, the manuscript writing tools and instruments, composition styles of the Indian manuscripts, various design features, a schematic structure of manuscripts are dealt in detail. The journal articles on the manuscript design trends in the various countries of the world also reviewed to understand similarities and differences in design features. An overview of modern graphic design (publication design), taken into consideration for comparative analysis. These modern designs are fashioned out of digital technology and are functional with the user-centric approach.

The aim of this chapter is to discuss research methodology applicable to this particular study. The chapter contains the sections explaining approach to the problem, objectives, hypothesis, research design and methodology, data collection, scope and limitations of the study.

3.2 Approaches to the Problem

The researcher has chosen qualitative method using non-numerical data with the interpretive approach. Interpretivism is an explorative way in which strategies followed are by observation. Interpretivism approach mainly chosen in sociology, cultural and anthropological research which communicate the artwork (Hickman, 2008). Interpretive methods rely upon linguistic rather than numerical data. The data collected in the application of such methods are without pre-categorization with important aspects, and the variations are identified in the samples. Since qualitative analysis does not involve power analysis sample size is less in number but chosen depending upon the criteria. (Robert Elliott, 2005, pp. 147-152)

The researcher initially identified repositories of handwritten manuscripts available in the state of Maharashtra, India. The later on the researcher has visited various accessible libraries personally to collect sample data. In the libraries, the manuscript catalogues

were screened first to locate for the seventeenth century Devanagari Brahmanical manuscripts. These manuscript catalogues available in the libraries have remained the basic source of data collection for this research work. The researcher could get the access to handle a few manuscripts physically. The basic information documented in the spreadsheet under various heads such as library accession number, year of making, size, number. of lines, number of folios, along with observations such as special remarks. The remarks are nothing but principal observations of the manuscripts, which led the researcher select ultimate final representative samples for the study.

The data of relevant manuscripts needed for the research collected by taking photographs of selective pages. A few libraries provided photocopies of the representative pages of the manuscripts that have potential for the study.

Apart from this, the criteria have been defined to study various aspects of the selected manuscripts. These predefined categories and identified variables have guided the researcher to select representative sample of the manuscripts for the study of the population.

A review of the literature and conceptual framework has further helped the researcher formulate the strategy to analyze representative manuscripts using variables.

These selected manuscripts were scrutinized using visual representation method and application of visual thinking technique – the practice-based method used to explore and present research finding (Gray and Malins, 2008, pp 103-107). Computer-aided visualization through diagrams is utilized as a tool. Finally, the qualitative content analysis have been carried out, which was based upon the variables related to modern design principles practiced for designing a publication.

The observations of the manuscripts have been compared with various types of modern book designs or the publication designs — a specialized area of modern graphic design. These publications comprise printed small booklets, books, magazines, etc. The publications are chosen from a wide range of subject; such as religion, history, poetry, science, mathematics, literary science, fiction, etc. They are primarily in Devanagari script. However, English being global language of publications in Roman script is also considered. The conclusions are drawn based on the observations to validate the hypothesis.

3.3 Reason for Choice of the Topic

This study will reveal the history of publication design in India prior to printing technology revolution, which began in India in the eighteenth century. It will be interesting to find out the similarities and differences in the page layout designs of the manuscripts and the modern publication design aspects. This explorative study will compare layouts under the various head of layout design. The researcher strongly believes that the designers of the Devanagari Brahmanical manuscripts of the seventeenth century available in Maharashtra had knowledge of graphic design, and they had their own system and method of page layout design. The preliminary observations of the manuscript designs of the seventeenth century revealed that manuscript designers have followed a definite process for creating them. These manuscript design styles and patterns are different from the manuscripts of the other cultures. These patterns and styles are still noticeable in the modern publication designs in India. Hence, the researcher wanted to contribute significantly in the area of history of publication design in India through all these observations in-depth with a systematic approach.

3.4 Title of the Thesis

The title of the thesis is **"COMPOSITION AND LAYOUT DESIGN OF THE SEVENTEENTH CENTURY DEVANAGARI MANUSCRIPTS IN MAHARASHTRA AND MODERN GRAPHIC DESIGN: A COMPARATIVE STUDY OF DESIGN CONCEPTS"**.

3.5 Objectives of the study

The main objective is to study "COMPOSITION AND LAYOUT DESIGN OF THE SEVENTEENTH CENTURY DEVANAGARI MANUSCRIPTS IN MAHARASHTRA AND MODERN GRAPHIC DESIGN: A COMPARATIVE STUDY OF DESIGN CONCEPTS".

The study will focus the following objectives:

A. To understand the conceptual layout design process of the seventeenth century Devanagari Brahmanical manuscripts
B. To study various types of compositions and layout designs of the seventeenth century Devanagari Brahmanical manuscripts

C. To investigate traditional Indian design thoughts related to functionality and aesthetics of page layout design.
D. To evaluate relationship between the seventeenth century Devanagari Brahmanical manuscripts design and contemporary publication by articulating foundation design aspects of layout and composition
E. To analyze and interpret the data
F. Finally, to draw conclusion

3.6 Hypothesis of the Study

The main hypothesis is the seventeenth century Devanagari Brahmanical manuscripts designers followed design theories in the planning of handwritten manuscripts.

Other Hypotheses:-

H_0 -1 A structure of manuscripts contains many elements which are continued in modern publication design.

H_0 -2 Devanagari Brahmanical manuscript designers followed distinct system, style, and pattern for manuscript design.

H_0 -3 Devanagari Brahmanical Manuscripts designers believed in simplicity and hence they focused on the content of the text and followed minimalistic approach to other factors such as decoration and ornamentation.

H_0 -4 Manuscript designers explored various types of editorial style depending upon the type of content

H_0 -5 Manuscript designers employed design principles in composition of layout

H_0 -6 Devanagari Brahmanical Manuscript designers of the seventeenth century remained unaltered by the thoughts of other contemporary design ideas and they did not adopt any other style in their design

3.7 Proposed Study

This researcher will explore selective representative manuscripts under various heads of fundamental principles of graphic design. The objectives of the study include understanding manuscript architecture i.e. form, structure, layout grid, baseline grid,

margins, columns, text flow, and page-turning system. There were other objectives as well, for instance, appearance, binding system and its effect on the page layout. Visual factors such as various layout styles, placement of elements, size, readability, legibility of text, use of colour, use of contrast to achieve visual order & hierarchy, consistency in placement and among decorative elements on pages, navigation system, cover page, separator page design, text wrapping for visuals, title page, etc.

The observations of the manuscripts will be compared with modern graphic design, especially with the publication design. The contemporary publications based upon key variables with respect to layout and composition strategies will be studied in this research as well.

3.8 Assumptions

The study assumes that the Devanagari Brahmanical manuscript designers of the seventeenth century Maharashtra were aware of aesthetics and its application in page layout design. They followed design principles similar to modern publication design while producing Devanagari Brahmanical manuscript. A form of books and the layout styles practiced in the seventeenth century Maharashtra are found in modern publication designs. Based upon the content and the subject of the manuscript, the designer has adopted appropriate layout and editorial styles.

3.9 Research Design and Methodology

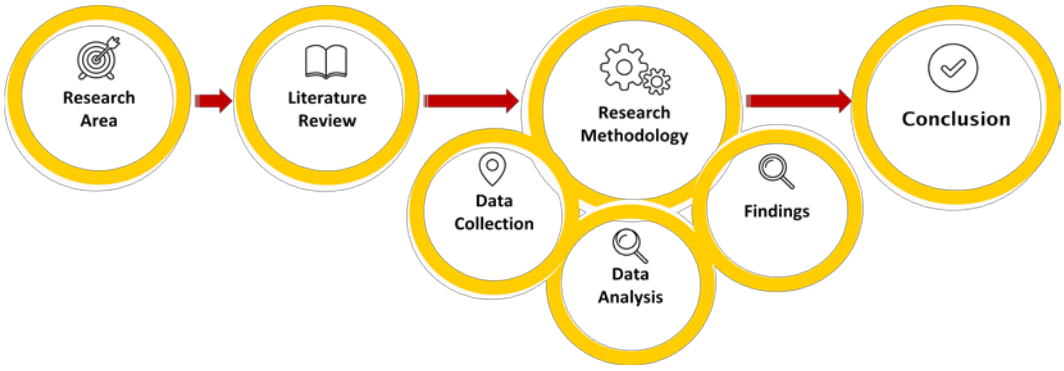


Figure 3.1: Research Model – Design and Methodology

3.9.1 The Universe

The study is undertaken to find layout and composition styles of the seventeenth century handwritten Devanagari Brahmanical manuscripts available in Maharashtra.

The manuscripts have been considered as cultural heritage of India. According to a mission initiated by the Government of India to preserve handwritten manuscripts 'The National Mission for Manuscripts', the large number of manuscripts are found spread across India. Such manuscripts are estimated to about five million in number, i.e. the largest collection in the world. They are in the custody of various institutions, and private collectors. Documentation of large number of manuscripts is yet to be done. Manuscripts are found in diverse scripts, languages; and they are aesthetically decorated with a variety of themes, illustrations, calligraphy, illuminations, etc. (History, 2016).

3.9.2 Selection of the Sample

Devanagari Brahmanical manuscripts of the seventeenth century, which are available in Maharashtra, have been selected for the study. They are available in a variety of subjects and are beyond religious boundaries. They have been written outside temples and monasteries as well.

The criteria for selection of sample are based upon approach used in finalizing samples (Jane Ritchie, 2003, p. 96). Various samples chosen from populations are with the level of diversity and defined criteria. In addition, the selection of the sample is based on the aim of the study. A review of literature and formulation of hypothesis are guided in identifying characteristics of the manuscripts to be studied, and the variables on which manuscripts are analyzed.

The elements useful to study manuscripts can be best summarized into two groups:

1. Layout and ruling were crucial in revealing structure and styles
2. Types of decoration were supportive in revealing in artistic practices

Primary criteria for the Selection of the Manuscripts:

- Manuscript drafted or written on a paper
- Script used for writing is the Devanagari
- Manuscript should be complete with date

Secondary Criteria for the Selection of the Manuscript:

Based on the layout formats, the representative manuscripts have been selected for the study. The selection criteria has based upon following features so that it could achieve the aims and objectives of the thesis. They are as follows:-

1. Manuscript, which will enable to study form, functions and page architecture
2. Typography oriented manuscripts with the rubrics

3. Manuscripts with the use of accent marks
4. 'Bilingual' or multilingual manuscripts
5. Manuscripts with distinct layout styles
6. Manuscripts comprise illustrations or diagrams
7. Manuscripts with distinct design features
8. Manuscripts design influenced by various cultural designs

Printed modern publication designs with a variety of subjects and sizes selected to compare them with the above-mentioned purposive samples of the seventeenth century Devanagari Brahmanical manuscripts. The samples chosen are: (i) books printed in Devanagari and in Roman scripts; (ii) the publications with only typography, and (iii) the publications with typography and imagery with variety of layout styles are considered for the study.

3.9.3 Period of the Study

This study has been conducted during January 2011 to December 2016.

3.9.4 Tools used for collection and Synthesis of Data

In this study two types of data have been collected, i.e. primary data and secondary data.

Tools used for collecting primary data are-

- Digital Photography
- Photocopy Machine

To demonstrate construction methods used for making of template designs, the vector graphics digital software such as CorelDraw, Adobe Illustrator put into application. Documentation of data recorded using Ms-Excel. Computer generated imagery created in Adobe Photoshop to get visual effects.

3.9.5 Primary Data:

The key source of information for the research is in the form of digital photographs and photocopy of the pages of the manuscripts. First, the libraries and repositories have been identified from various sources and visited them. The catalogues were examined for the seventeenth century Brahmanical Manuscripts in Devanagari script and meaningful data was documented. Further, a few manuscripts were observed physically. Listed them, and collected the information based on the criteria prescribed. A few

representative manuscripts were chosen as a purposive sample for the study. The researcher strictly followed guideline prescribed by National Mission for Manuscripts of India while handling, scanning and photographing the manuscripts.

For a comparative study of the above-mentioned manuscripts, the contemporary printed publication designs with distinctive design feature were chosen.

3.9.6 Secondary Data

Secondary data collected from various sources like:

1. Web sites and other online sources using search engines on the Internet
2. Books
3. Magazines
4. Reports and publications of the organizations
5. Newspapers
6. Journals (International & National) with ISSN/ISBN numbers.
7. Articles published/unpublished
8. Master and Ph.D. dissertations in the related area

Secondary data collected from various libraries, institutional websites, and online sources, for instance, Victoria Albert Museum, Oxford Museum, British Library, Jainepedia, Indira Gandhi National Centre for the Arts (IGNCA), New Delhi, Museums of India, etc.

Undergone video tutorials of free online courses available at Stanford University and Khan Academy. The online course 'Art of Medieval Europe' – A book and the dissemination of knowledge in medieval Europe teaches medieval bookmaking process. This online course gave insights on how books were produced, used and circulated in the monasteries of Europe during the medieval period, and finally turned out a part of the personal library.

3.10 Significance of the Study

The manuscript is a manual hard work and extraordinary expression of human designing skills, which needs to be appreciated, preserved and followed for further enhancement in the area of Graphic Design. The manuscripts in India are valuable historical sources handed over to the present generation of scholars. They touch upon a wide spectrum of topics, social as well as religious.

The in-depth study of design and layout composition will be useful for the deep understanding of the seventeenth-century Indian design perspective in Devanagari Brahmanical Manuscripts. This investigation will provide a new dimension in understanding Indian Design History and throw light upon the layout and compositional styles and techniques.

The manuscript design process includes the use of design elements such as margins, columns, alignment of text, folio number (page navigation system), text in the handwritten calligraphic form, illustrations, symbols, colophon area, etc. Paintings or illustrations are placed along with a text on a page as a supportive element. In the beginning and in the endnote areas (colophon area) of the manuscripts, one can easily identify the author, subject, geographical area, time of the manuscript, etc. In the manuscript designs, the symbols are used for the specific purpose (semiotic). Similarly, the fundamentals of design are also applied to enhance the aesthetic value of layout. If a manuscript is part of a private collection or got a good patronage for drafting and designing then one can see special colours, e.g. silver and gold in paintings.

This study will focus on the Indian Graphic design concepts and ideologies of the seventeenth century Devanagari Brahmanical Manuscripts available in Maharashtra. The design features of manuscripts are compared with modern graphic design.

3.11 Scope and Limitations of the Study

Although the region is chosen for the study i.e. Maharashtra, one of the states in India, but reaching every manuscript for the study require teamwork, a huge amount of funds and time. The researcher has also observed that most of the available manuscripts are incomplete and with non-occurrence of date.

Calligraphic details of the manuscripts have not been studied in-depth in the current study. In-depth study of calligraphy, typography and font design is a specialized branch of Graphic Design. Such type of study involves an integration of various aesthetics related to form studies of the script and technical attributes associated with software and programming. Only readability, legibility, bold, and contrast features are considered for the study.

Although Jaina manuscripts of the seventeenth century were also written in Devanagari script, they are not considered for the study because the style followed in designing them, is a unique. The patronage of the Jaina has influenced in the form of rich

ornamentation and bold approach to colour. Therefore, the study of Jaina manuscript altogether requires separate treatment for their investigation.

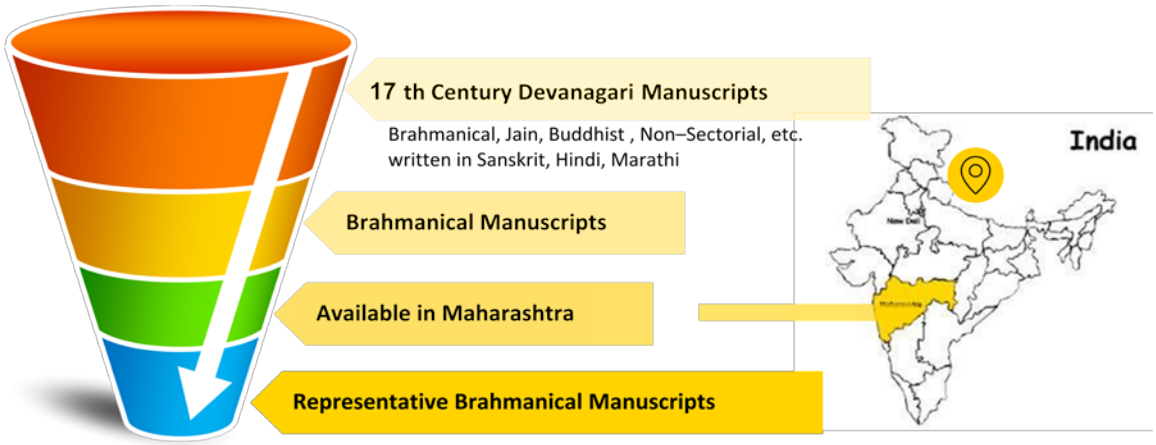


Figure 3.2: Funnel Diagram – Focus Segment for Manuscript Study

Today, in the twenty-first century because of the innovations and development in the field of digital technology interactive publications are also available along with printed books. These interactive eBooks and ePubs are not taken into consideration for the study. Interactive publications are not static and they heavily influenced by animated elements. Such responsive designs adapt their layout as per the viewing environment i.e. electronic gadget e.g. mobile phone, tablet, Pc, and Laptop screen with a fluid grid.

There are many limitations in the study of the manuscripts and hence this researcher could not reach out up to every manuscript. The first reason is they are huge in number and are spread across the state. The second reason is they are in the collection of private or institutional guardianship. Therefore, the researcher thought of categorization of available manuscripts depending upon various layout, compositional styles and selected representative manuscripts for the study.

3.12 Method of Data Collection

The Objective of ‘The National Mission for Manuscript’, an ambitious project of Government of India, is to find out and preserve innumerable manuscript wealth of India. The Mission has identified and collaborated with prominent institutions with large holdings of manuscripts. These institutions are partner centers categorized under five zones: North, South, East, West, and Center. Major works done at these institutions are related cataloguing and microfilming to digitize manuscripts in their repositories. Through these institutions, the ‘Indira Gandhi National Centre for the Arts’ (IGNCA),

New Delhi made available catalogues of the manuscript repositories situated in every state of India. They are available on IGNCA website with the help of 'The National Mission for Manuscript' (http://www.ignca.nic.in/). This guided the researcher identify the list of the institutions from the West zone located in Maharashtra.

3.12.1 Sequence of Steps followed in Collecting Primary Data

Primary Data Collected from various libraries / repositories located in the state of Maharashtra, India.

1. The researcher initially identified the repositories, which has a collection of old handwritten manuscripts in Maharashtra and listed them.
2. Planned official visits to the libraries.
3. Library Work: First catalogues were screened and listed down the seventeenth century Devanagari Brahmanical manuscripts.
4. Later physically observed few manuscripts and studied thoroughly their layouts and designs in detail.
5. Photographed and photocopied pages of representative sample of selective manuscripts for study.

Table 3. 1: List of Repositories for Manuscripts Collections in Maharashtra

Sr. No.	**Institution**
1	Anand Ashram Samasthan, Pune
2	Asiatic Society, Mumbai
3	Bhandarkar Oriental Research Institute (BORI), Pune
4	Bharat Itihas Samshodhak Mandal, Pune
5	Deccan College Post Graduate and Research Institute, Pune
Sr. No.	**Institution**
6	Kavikulaguru Kalidas Sanskrit University, Nagpur
7	Mumbai University, Mumbai
8	Nagpur Central Museum, Nagpur
9	Chhatrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai
10	Samartha Vagdevata Mandir, Dhule Repository, Dhule
11	Savitribai Phule Pune University (Jaykar Library), Pune
12	Vedic Samsodhan Mandala, Pune

Table 3. 2: **List of the Seventeenth Century Devanagari Manuscripts at Various Libraries**

Sr. No.	Resource Institution	Manuscripts Listed from Catalogue
1	Anand Ashram Samasthan**,** Pune	12
2	Asiatic Society, Mumbai	23
3	Bhandarkar Oriental Research Institute (BORI), Pune	30
4	Bharat Itihas Samshodhak Mandal, Pune	99
5	Deccan College Post Graduate and Research Institute, Pune	51
6	Marathi Manuscript Center, (catalogue) Pune	7
7	Samartha Vagdevata Mandir, Dhule Repository	24
8	Savitribai Phule Pune University (Jaykar Library), Pune	4
9	Vedic Samsodhan Mandala, Pune	24

Total 274 Devanagari manuscripts of the seventeenth century listed down from various libraries of Maharashtra. Out of these data of 230 Devanagari Brahmanical manuscripts related to size and orientations of text on page have been recorded. Collected information, documented categorically such as library name, accession no., description, remarks.

Modern graphic design especially publication design related data collected from books in personal and institutional libraries, and web sources.

3.12.2 Secondary Data

Secondary data collected from various online sources, books, research articles, journals, etc. Online libraries such as British Library, Bouldien Library, Victor & Albert Museum, Jainepedia, etc. have a large collection of manuscripts.

Visual data regarding the sitting posture of Indian and people from other cultures collected from internet and museum/library websites.

3.13 Techniques of the Data Analysis

For content analysis representative manuscripts were selected, categorized under three theme based conceptual framework and design- related variables. These three themes are; (i) Form and function, (2) Composition and layout design, and (3) Layout styles and fundamentals of page layout principles. Visual inspection carried for variables identified under five building blocks. The manuscripts studied under these categories

using an amalgamation of techniques. These techniques are ‘Visual Representation’ and ‘Deconstruction’.

Visual representation constructed through digital diagrams. Visual thinking technique – practice-based method applied to explore and presented research finding (Gray and Malins, 2008, pp 103-107). Tool chosen is computer-aided visualization through diagrams. For every criterion different techniques were followed, are discussed in ‘Data Analysis and Interpretations’ chapter separately.

Content analysis technique is implemented through observation, practical, comparative and qualitative method. It enhanced the chances to discover similarities and differences among the visual elements of the seventeenth century Devanagari Brahmanical manuscripts and contemporary publication design. In addition, a code sheet developed to record observations regarding layouts and compositions. Coding coordinated in theory analysis, reveal framework of patterns. While analyzing the data and testing of the hypotheses qualitative method was followed.

Chapter 4

Data Analysis and Findings

Introduction

This chapter aims to explore thoroughly the design concepts of the handwritten Devanagari Brahmanical manuscripts of the seventeenth century in Maharashtra, India.

The objectives of this study are to bring to light the design thoughts and knowledge employed in the manuscript design in the seventeenth century. In the state of Maharashtra, the application of full-fledged printing technology for printing socio-publications began in the eighteenth century. A common noticeable fact is that; technology, cultural interactions, changes in rule/reign etc. always predominate and add new dimensions to the modern visual communication. This research will illuminate the publication design history of the seventeenth century Maharashtra, (India) prior to the arrival of printing technology, which was introduced in India by the Europeans. This phenomenon further brought the change in the magnitude of Indian design.

This chapter will begin with addressing various design aspects of layout and composition of the representative handwritten Devanagari Brahmanical manuscripts of the seventeenth century, and they will be compared with aspects of the modern graphic design, especially with the publication design principles.

Research Method and Procedure

For the purpose of analysis, the manuscripts collected from various repositories and categorized them under various themes as per the modern graphic layout design concepts. These selected manuscripts incorporate a range of styles and design elements, e.g. foliation or pagination, ruling patterns and methods, page-layout with the grid, text, illustrations and other design features. Each representative manuscript has been studied to understand a specific design feature used in it. Modern books with functional and utilitarian page layout design selected in order to compare their design aspects with the seventeenth century Devanagari Brahmanical manuscripts. Modern book selection

criteria included a variety of subjects, and their range of content integrated with text, imagery, illustrations and use of design elements.

A graphical representation and deconstruction methods were adopted to visualize and analyze the data and comprehended the similarity and differences in the design concepts. A comparative analysis is accomplished with the help of assorted graphic design fundamentals and composition design techniques practiced in modern publication design. A visual thinking technique and, a practice-based method are employed in the research to explore and present research finding (Gray and Malins, 2008, pp 103-107). Computer-aided digitally illustrated visualization method is implemented as a tool to draw diagrams. Digital photography and photocopying machines are put to use as assistive tools to collected representative samples. Observation methods are taken into account to compare and relate the concepts.

Analysis of page layouts of the representative manuscripts and the selective modern books put into the execution based on the criteria, which make them functional and reader friendly. The study of the criteria includes their form, structure, composition styles, layout styles, and design features.

Apart from the above-mentioned areas, an aspect has been linked to traditional sitting posture of the Indian reader and the writer is intentionally considered. This information provided is an adequate guidance of how folios of the manuscript were read or written in the ancient India as well as in the seventeenth century.

Traditional Reading and Writing Postures of the Indians

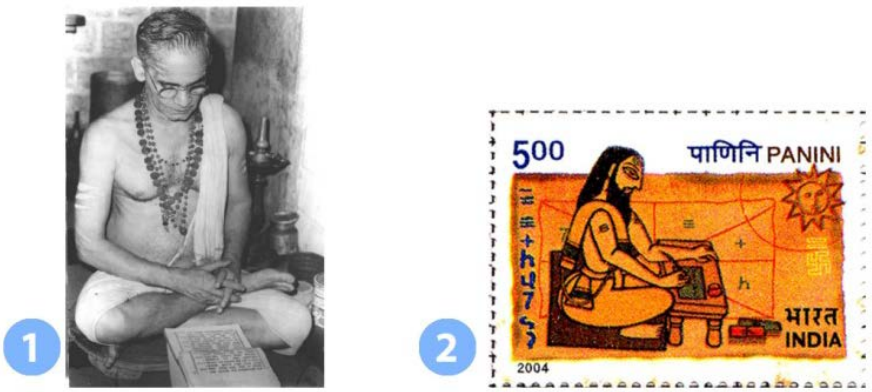


Figure 4.1: ❶ Indian Reader – (People of India, 2014) ❷ Indian Writer - A Commemorative Postage Stamp on 'Panini' released by Indian Post Department, 2004 (Postage Stamp,2015)

Thematic Categories of the Manuscripts – Conceptual Framework

Based on the layout formats and distinctive graphic design features, the representative manuscripts were selected for the study; further, they were compared with modern book designs to understand similarities and differences in design aspects.

Classification of Representative Manuscripts based on Graphic Design Features:

Theme 1: Form and Function — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Designs

Theme 2: Composition and Layout Design — Seventeenth Century Devanagari Brahmanical Manuscript and Modern Publication Design

Theme 3: Layout Styles and Fundamentals of Page Layout Principles — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Design

A model based on five building blocks derived for visual inspection. It is comprise of variables related fundamental of design, page layout principles, and objective of the study.

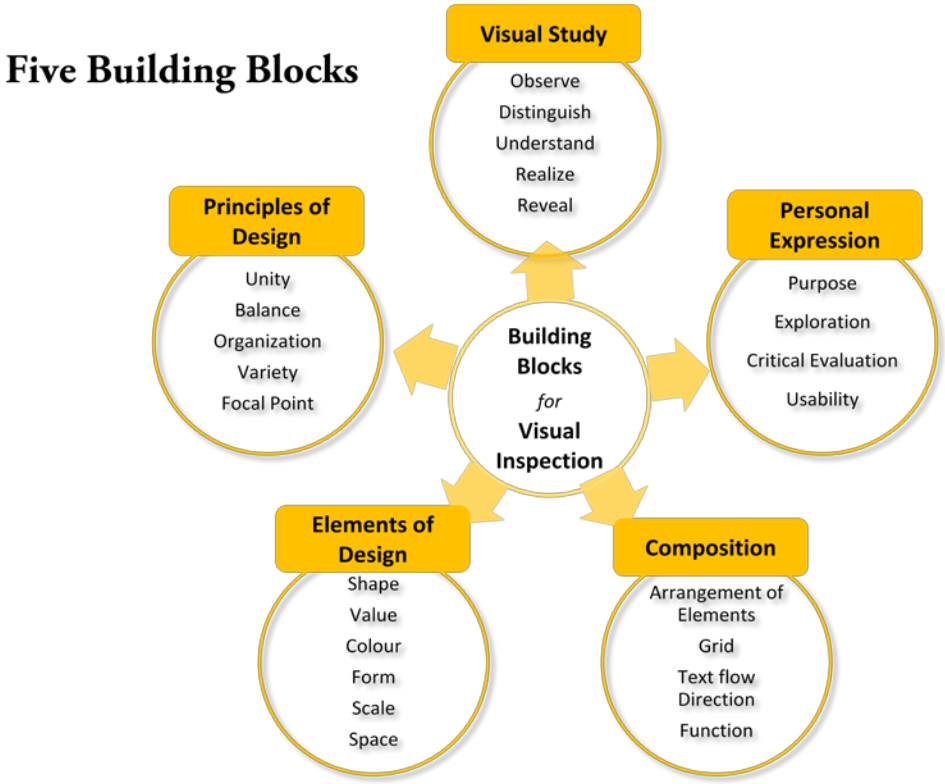


Figure 4. 2: Building Blocks for Visual Inspection of Data

4.1 Theme 1: Form and Function of Devanagari Brahmanical Manuscripts and Modern Publication Design

4.1.1 Aims and Objectives

To examine the features corresponding to the form and the function of the seventeenth century Devanagari Brahmanical manuscripts available in Maharashtra.

The objectives of this study are to know various forms of the seventeenth century Devanagari Brahmanical manuscripts and their functional approach with simplicity in the form. It includes:

(1) Page formats,
(2) Page turning system, and its association with placements of turned pages
(3) Flow of reading without interruption
(4) The ergonomic convenience in handling folio

4.1.2 Approach to Study Forms and Functions of Manuscripts

The seventeenth century Devanagari Brahmanical manuscripts are identified and systematically recorded their external features for testing of the hypothesis.

H_0 -1 A structure of manuscripts contains many elements which are continued in the modern publication design

i) Understand and analyze representative manuscripts to understand their formats, various sizes, page-turning system, orientation of text and text flow pattern
ii) To collect evidence, this can be correlated to the physical ergonomics and reading-writing pattern of Indian tradition.
iii) Correlate collected data from the manuscripts with modern publication design

4.1.3 Data Collection

4.1.3 - (a) Page Formats

4.1.3 - (a1) Seventeenth Century Devanagari Brahmanical Manuscripts

Total 257 Devanagari Brahmanical manuscripts of the seventeenth century selected through catalogues from various libraries of Maharashtra. The data related to sizes and orientation of text are recorded in Tabular format as shown below:

Sr. No.	Library	Access-ion No.	Title of Manu-script	Mate-rial	Year/ Age	Size Width and Height	No. of Lines/ page	Characters/ line	No. of Folios

Collected information is further categorized based upon two main criteria: (1) portrait format i.e. vertical orientation and; (2) landscape format i.e. horizontal orientation, depending upon their aspect width and height ratio respectively. It is explained in Table 4.1 shown below:

Table 4.1: Statistics: Manuscripts and Their Page Orientation

Resource Library	**Total No. of Manuscripts**	**Portrait Format**	**Landscape Format**
Deccan College Post Graduate and Research Institute, Pune	53	53	-
Vedic Samshodhan Mandal, Pune	23	23	-
Anandashram Sansthan, Pune	12	12	-
Bhandarkar Oriental Research Institute, Pune	30	30	-
Samarth Vagdevata Mandir, Dhule	24	22	2
Asiatic Society of Bombay, Mumbai	15	15	-
Bharat Itihas Sanshodhak Mandal, Pune	99	99	-
Total	**257**	**255**	**2**

Table 4. 2: Recorded Manuscript Size Range

Orientation of Manuscript	**Width**			**Height**	
	Minimum	Maximum		Minimum	Maximum
Landscape	6"	13"		4"	$8^{1}/_{2}$"
Portrait	$4^{1}/_{2}$"	$8^{1}/_{4}$"		7"	$9^{1}/_{2}$"

Landscape Format Manuscript - Representative Sample of the Seventeenth Century Devanagari Brahmanical Manuscript

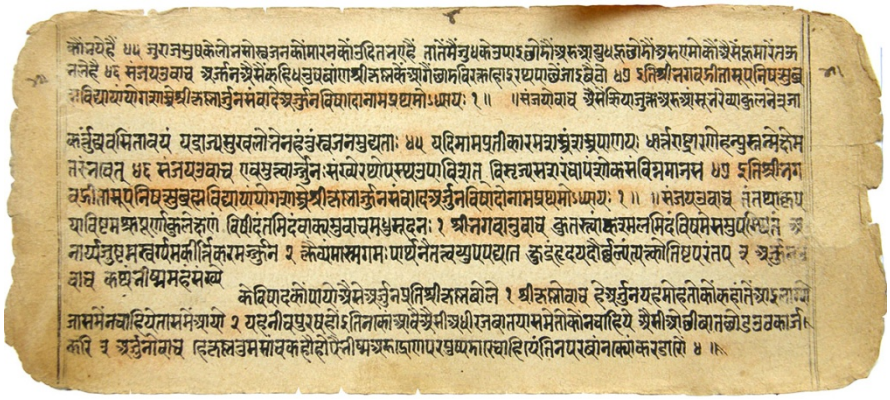


Figure 4.3: Landscape Format – The Seventeenth Century Devanagari Brahmanical Manuscript, BISM, *Bhagvad Geeta Saitkah*, 1696 AD

Portrait Format Manuscript - Representative Sample of the Seventeenth Century Devanagari Brahmanical Manuscript

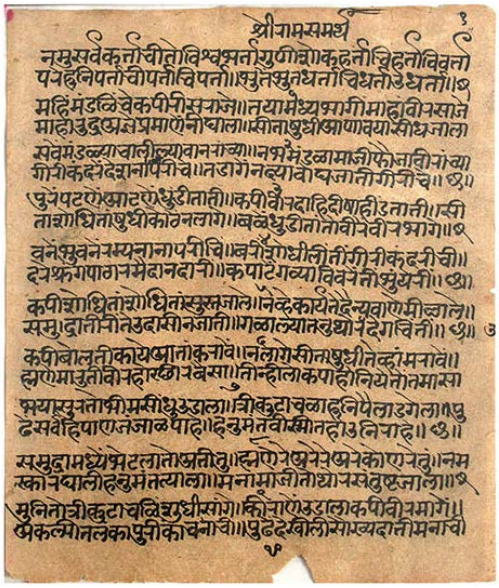


Figure 4.4: Portrait Format – Seventeenth Century Devanagari Brahmanical Manuscript, SVM, *Kalyanpotha*, 17th Century AD

4.1.3 - (a2) Page Formats of Modern Publication Design

Sizes of Modern Books

Modern books are designed in various sizes. Their book-sizes may vary as per the requirement, but the graphic designer takes utmost precautions while planning the layout. The size of the book is chosen to fit into different sections. These sections are formed by folding ISO standard size paper e.g. when A0 is divided into half, it creates

A1; when A1 divided into half, creates A2 and so on. This is the most economical approach with minimal wastage of paper as shown in Figure 4.5.

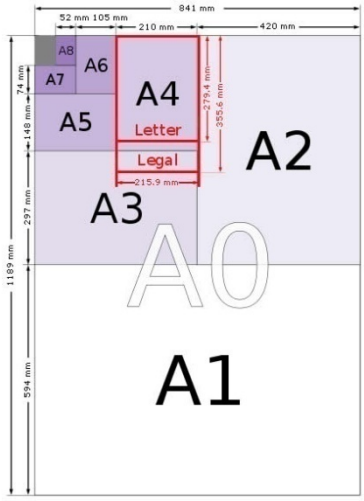


Figure 4.5: A0 Series - ISO Standard Paper with Various Subdivisions

Modern books further categorized under three different formats.

1. Portrait — width is less than height
2. Landscape — width is more than height
3. Square — width and height of book are of the same size

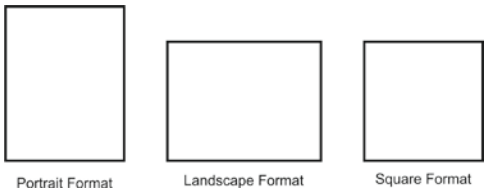


Figure 4. 6: Digital Illustration showing Modern Publication Design Formats

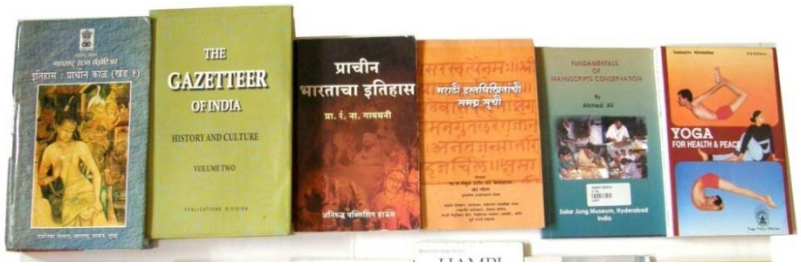


Figure 4. 7: Portrait Format Representative Modern Publication Designs

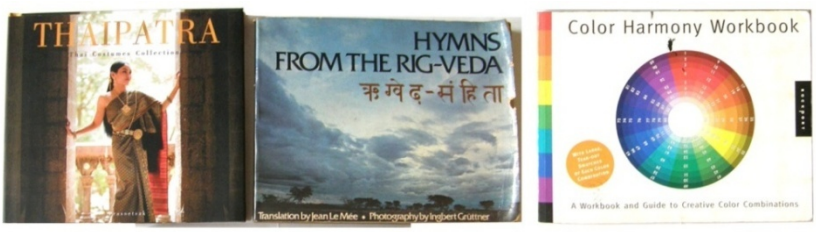


Figure 4. 8: Landscape Format Representative, Modern Publication Designs

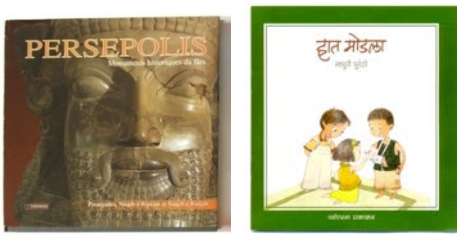


Figure 4. 9: Square Format Representative Modern Publication Designs

Modern book sizes are also scrutinized to know the utility and portability. Following are few examples of landscape and portrait format pocket-size books. These books are not only portable but also easy to carry and read while travelling.

Representative Samples of Landscape and Portrait Formats Pocket Size Books



Figure 4.10: Pocket Size Portable Books - Landscape and Portrait Formats, Modern Publication Design

4.1.3 - (b) Page Turning System and its Association with the Reading Pattern, Text Flow, and Eye Movement of the Reader

4.1.3 - (b1) Page Turning System: Seventeenth Century Devanagari Brahmanical Manuscripts

Representative manuscripts are selected to examine the page-turning system, and its functional aspects are correlated to their interface. Two types of the representative manuscripts from each category of landscape and portrait formats are chosen for the investigations.

Following areas are analyzed in-depth as a basis of reasoning, through three digital experiments to verify the hypothesis.

(i) Page-turning, placement of turned folios, text flow pattern, eye-movement

(ii) Lifting of folio with both the hands in vertical direction

(iii) Orientation of Text on Front and Back Side of Folio

Details of Representative Manuscript in table form presented as under:

	Manuscript Title	**Physical Description**
1	*Patanjali Mahabhasya*	Orientation: Landscape (Vertical Page-turning System)
	Acc. No. 817, DC, 1653 AD	Size of Manuscript: Width 11.3" x Height 4.5"
		The Ratio of Width and Height: Approx.2.5: 1
2	*Shree Samarthakrut Yuddhakandachi Prat*	Orientation: Portrait (Horizontal Page-turning System)
	Bad No. 255, SVM, 17th Century	Size of Manuscript: Width $4^1/_2$" x Height 7"
		The ratio of Width and Height: Approx. 1 : 1.55

In the present digital experiment, three different scenarios of the page-turning system and reading patterns are examined in the context of referring text or content on the previous folio to understand the reading pattern. The following type of page layouts selected:

Landscape Page Layout : Scenario One and Two
Portrait Page Layout : Scenario Three

To understand the reading pattern of the Indian readers and the page-turning system, all scenarios are visually represented through graphical illustration (Figure 4.12).

Scenario 1: A folio turned in the vertical direction towards the top of the current folio.

Scenario 2: A folio turned in the horizontal direction towards right side of the current Folio.

Scenario 3: A folio turned in the horizontal direction towards right side of the current Folio

Every scenario is represented graphically in two parts:

Part 1:	Placement of a turned folio in a particular direction and the total space occupied by the current and turned folios.
Part 2:	An illustrated diagram depicting the direction of the text flow and eye movement with the help of red line with an arrow

Scenario 1: To begin manuscript reading with a bunch of folios. Once reading folio 1r is complete, keep it on the top side of the folio number 2f and start reading the current folio i.e. 2f. (see Figure 4.12)

Scenario 2: To begin manuscript reading with a bunch of folios. Once reading of folio 1r is complete, keep it on the right side of the folio number 2f and start reading the next folio i.e. 2f. (see Figure 4.12)

Considering the width and height ratio of the manuscripts (scenario 1 & 2) i.e. 2.5:1, it is difficult to turn the page with a single hand so there is a need to use both the hands for page turning and lifting a folio.

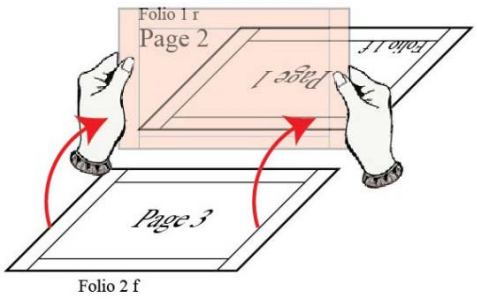


Figure 4.11: Digital Illustration of Diagram showing 'Turning a Folio' of the Manuscript, Seventeenth Century Devanagari Brahmanical Manuscripts

Scenario 3: To begin manuscript reading with a bunch of folios. Once reading of folio 2 is complete, keep it on the left side of the current folio and start reading the next folio i.e. folio 3 as shown in the digital illustration. (see Figure 4.12)

In all the three scenarios, one thing is very much common, and that is, all folios of the manuscript are not bound, glued, or tied together. Each folio is a separate leaf. Illustrated diagram for every scenario represented separately with red arrows indicates text flow and eye movement direction. (see Figure 4.12).

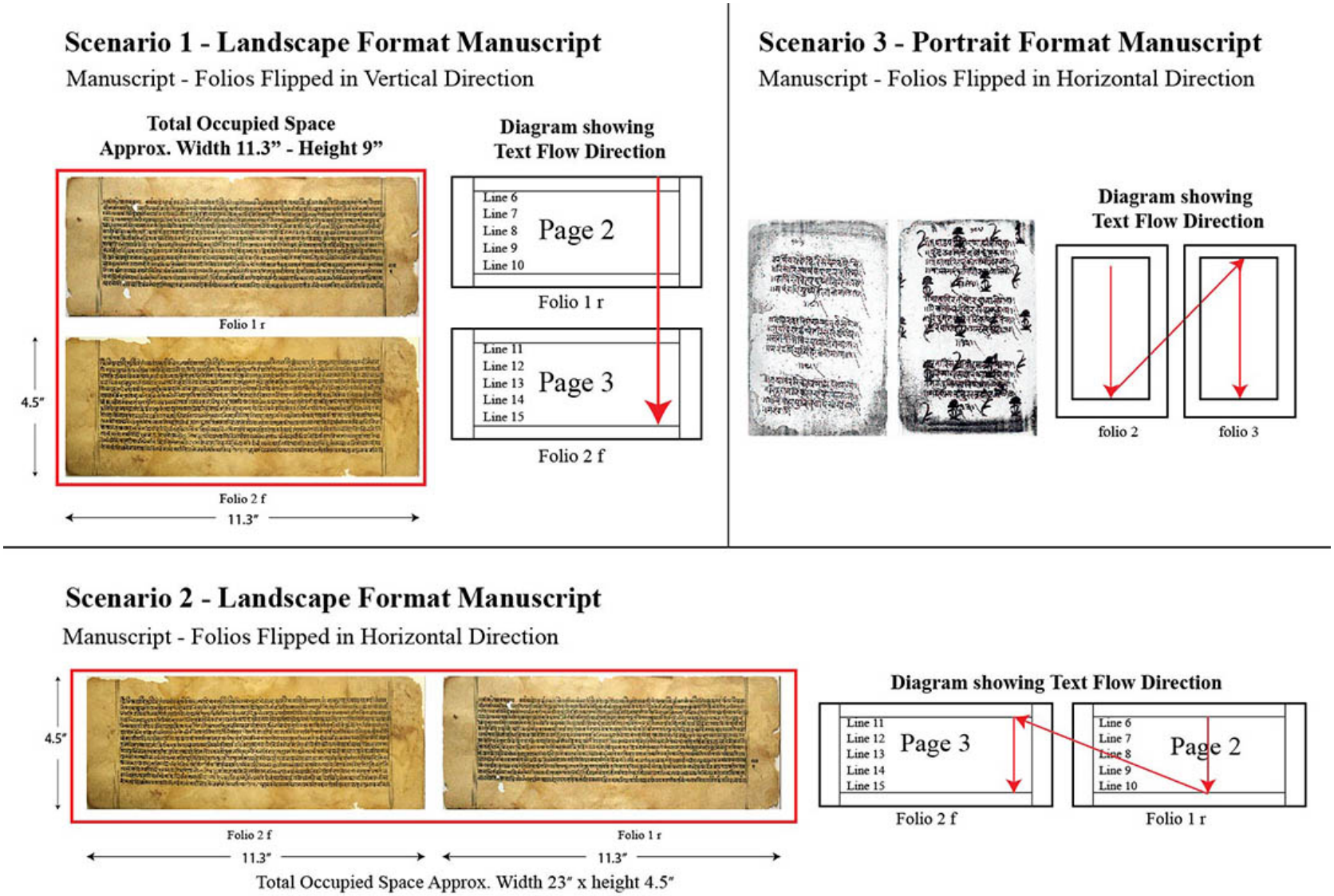


Figure 4. 12: Graphical Visual Representation of Page-turning Scenarios (1, 2, 3), Text flow, and Eye Movement Direction, Seventeenth Century Devanagari Brahmanical Manuscripts

4.1.3 - (b2) Page Turning System: Modern Publication Designs

Two major types of page turning system depending on the side of binding is preferred as shown in Figure 4.13. They are:

A - Turning page on the top of the pages or sections bound on the top side

B - Turning page on the left side of the pages or sections bound on the left side

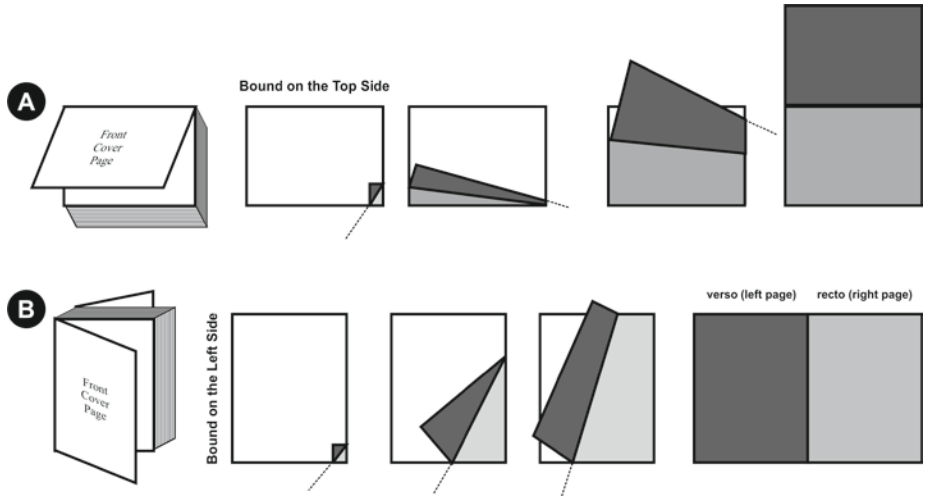


Figure 4.13: Digital Illustration - Top Side (Type A) and Left Side Binding (Type B) Methods and Page Turning Systems, Modern Publication Design

4.1.3 - (c) Text Flow Direction

In this experiment, the order and direction of text flow are observed.

4.1.3 - (c1) Text Flow Direction: Seventeenth Century Devanagari Brahmanical Manuscripts

Text or verses are written in a horizontal manner one after other from left to right margin. The text is a block of syllables written inside margin area, and it is without paragraphs. Circles marked in Figure 4.14 with red colour show punctuation marks in the form of two vertical lines i.e. *danda*. Extra space is left between two *dandas* indicate a number of the stanza or end of the section.

Details of Representative Manuscript:

Title of Manuscript	**Physical Description**
Samarthakrut - Ramayan - Sundarakand - Yuddhakanda	Orientation: Portrait (Horizontal Page-turning System)
Bad No. 746 Samartha Vagdevata Mandir 1622 AD	Size of Manuscript: Width $4^1/_2$" x Height 7"
	The ratio of Width and Height: Approx. 1 : 1.55

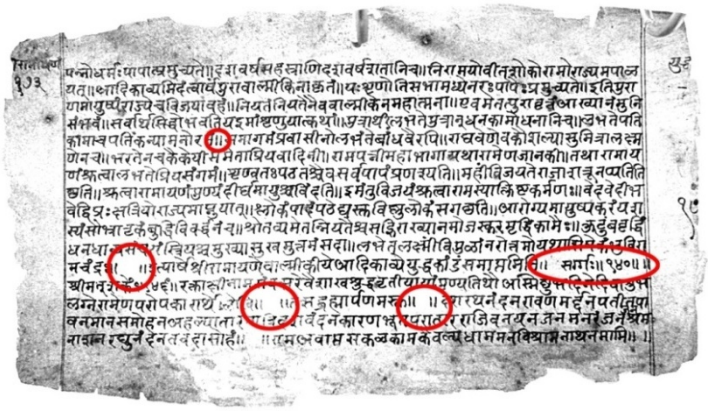


Figure 4.14: Text Writing Pattern of the Seventeenth Century Devanagari Brahmanical Manuscripts,

In all the three scenarios discussed in Figure 4.12, text flow direction is different. Text flow direction is conditional and dependent on the direction in which the turned folio is kept. Text flow direction of all three scenarios is explained separately in Figure 4.12

Orientation of the Text on Front and Back Side of the Folio

In this experiment, a manuscript folio is scrutinized to examine the text flow direction on the front and the backside. Details of representative manuscript:

Title of Manuscript	**Physical Description**
Patanjali Mahabhasya	Orientation: Landscape (Vertical Page-turning System)
Acc. No. 817 Deccan College Post Graduate and Research Institute, 1653 AD	Size of Manuscript: Width 11.3" x Height 4.5"
	The Ratio of Width and Height: Approx.2.5: 1



Figure 4.15: Orientation of the Text and Text Direction on Front (1) and Back Sides (2) of Manuscript Folio, Seventeenth Century Devanagari Brahmanical Manuscripts

The part number ❶ of Figure 4.15 make evidence a front side of the folio of the manuscript. Folio is closely observed from top edge to the bottom edge. The orientation of text is from top margin, and the text flows down towards bottom margin. A red line with an arrow indicates the direction of the text.

The part number ❷ of Figure 4.15 demonstrate the text flow direction of the backside of the folio. If a folio ❶ flipped horizontally, then it will be perceived as shown in ❷. The red line with an arrow indicates the text flow direction. Text flow direction is in the reverse order i.e. from bottom to top.

4.1.3 - (c2) Text Flow Direction: Modern Publication Designs

To study text flow in modern page layouts, representative sample books are selected based on their binding styles. They are as follows:

1) The first type: books bound on the top side of pages
2) The second type: books bound on the left side of the page

Representative sample books were further categorized into three groups, depending upon a number of columns employed in layouts.

Group 1 — (Figure 4.16) books are of the landscape orientation single column and bound on the top.

Group 2 — (Figure 4.17) books are of portrait orientation single column and bound at the left side.

Group 3 — (Figure 4.18) books are also of portrait orientation but the multiple or mixed numbers of columns employed in design and pages are bound at the left side.

4.1.3 - (c2) Group 1: Top Side Book Binding, Single Column, and Text Flow Direction

Physical Description of the Representative Samples		
Binding - Top Side	Landscape format	Single Column.

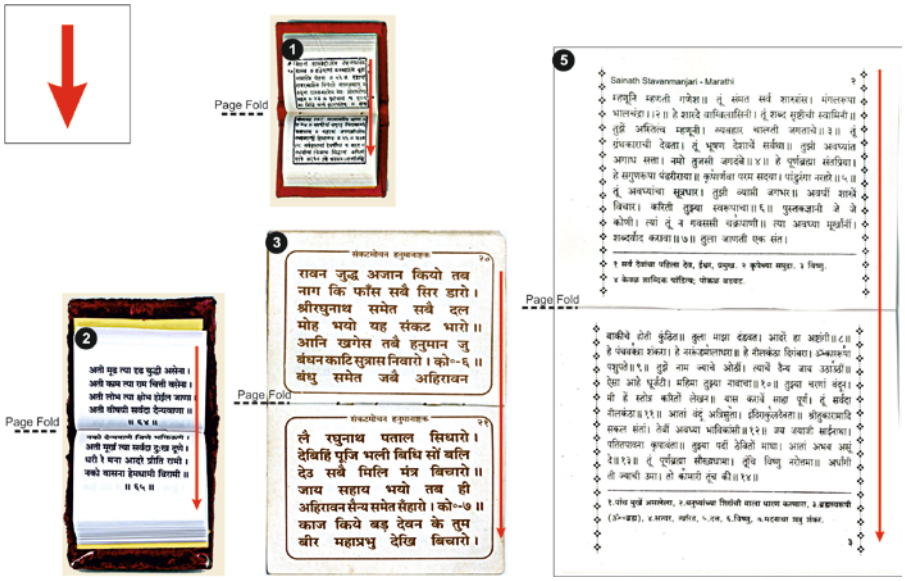


Figure 4.16: Top Side Book Binding (Group 1) - Red Arrow indicates Text Flow Direction, Modern Publication Design

4.1.3 - (c2) Group 2: Left Side Book Binding, Single Column, and Text flow Direction

Physical Description of the Representative Samples		
Binding - Left Side	Portrait format.	Single Column

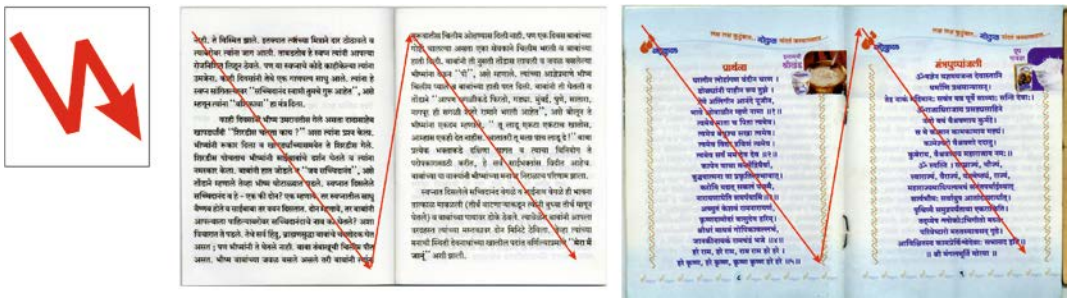


Figure 4.17: Left Side Book Binding - (Group 2) Red Arrow indicates Text Flow Direction, Modern Publication Design

4.1.3 - (c2): Group 3: Left Side Book Binding, Multiple Columns, and Text flow Direction

Physical Description of the Representative Samples		
Binding - Left Side	Portait format	Multiple Column

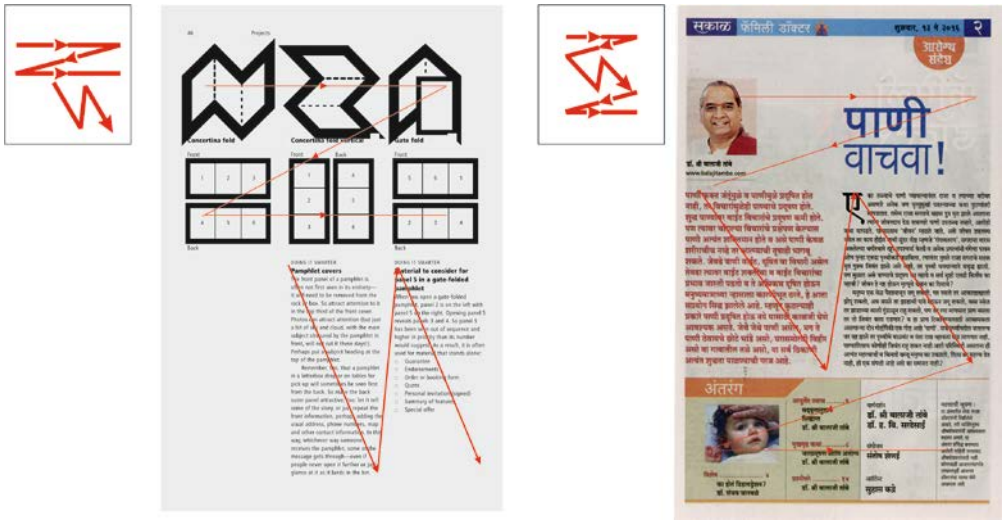


Figure 4.18: Left Side Book Binding (Multiple Columns) (Group 3) - Red Arrow indicates Text Flow Direction, Modern Publication Design

4.1.3 - (d) Page Imposition and Binding Systems

The page imposition technique is employed for printing on both the sides of paper i.e. front and back, aligning content of each side with other.

4.1.3 - (d1) Page Imposition and Binding Systems: Seventeenth Century Devanagari Brahmanical Manuscripts

After scrutinizing representative manuscripts, two types of page impositions found in the seventeenth century Devanagari Brahmanical manuscripts:

Type 1: Page imposition for a single page (Figure 4.19)

Type 2: Page imposition for double spread pages (Figure 4.20)

Details of Representative Manuscript in table form presented as under:

Type	Manuscript Title	Physical Description
1	*Patanjali Mahabhasya*	Orientation: Landscape (Vertical Page-turning System)
	Acc. No. 817, DC, 1653 AD	1 Page on one side of sheet
		2 Pages per Sheet

Type	Manuscript Title	Physical Description
2	*Kundamartanda - Suprabha Vyakhya* by *Anant Daivadnya*	Orientation: Landscape (Vertical Page-turning System)
	Acc. No. S 21-1-18 Anandashram Samsthan, 1688 AD	2 Pages on one side of sheet
		4 Pages per Sheet

Type 1: Deconstruction of the representative manuscript with single folio i.e two pages per sheet demonstrated in the following example (Figure 4.19). Content is written on a single folio in the manner of one page on each side of the folio. Later, folios of manuscript stacked one above the other in the sequence of reading i.e. from the beginning of the text to the end.

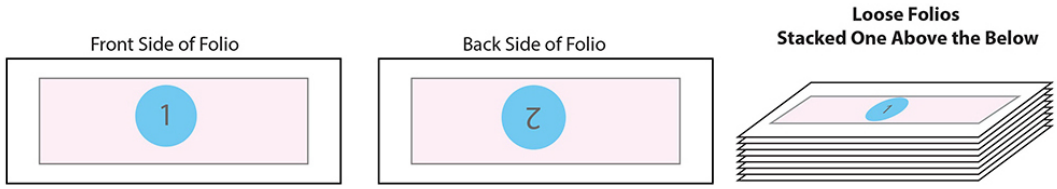


Figure 4.19: A Digital Illustration of Imposition and Binding - Manuscript with Single Page on One Side

Type 2: Deconstruction of following page imposition of the representative manuscript (Figure 4.20) demonstrates that the two pages are written on each side of the manuscript. Full sheet of paper as shown in Step 1, folded into half, which is demonstrated in Step 2. Further, two pages are planned with different orientation of text as shown in Step 3. These folded folios are stacked one on top of the lower, in sequence for reading i.e. from the beginning of the text to the end.

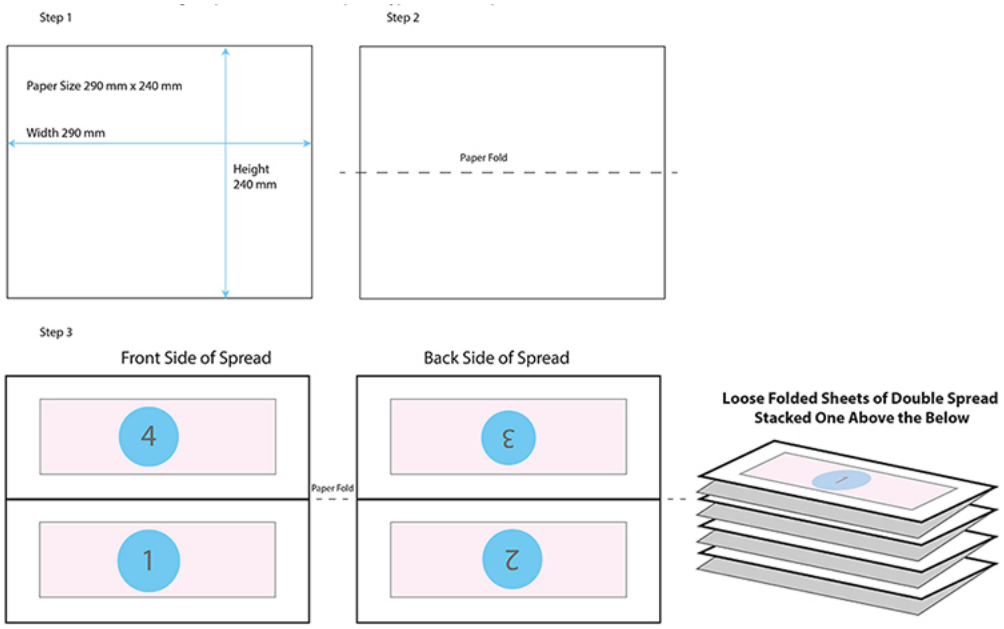


Figure 4.20: A Digital Illustration of the Manuscript with Double Spread with Paper Size and, Imposition of Pages on Front and Back Sides of Folios

Remarkable standardized binding system has been noticed in the entire representative manuscripts. In this system, the folios of a manuscript are seen wrapped together in a white or red cloth for protection and tied them with a cotton string. The folios of the manuscript are found separate and not stitched or bound together with a thread, or glue. Sometimes these folios are kept in between wooden planks for support. No section or Coptic binding is noticed in the manuscripts screened with a date, namely the seventeenth century.

4.1.3 - (d2) Page Imposition and Binding Systems: Modern Books

In a page imposition technique, first, a big sheet of paper is selected in such a way that multiple pages can be printed on front and backside of this big sheet. Same numbers of pages are arranged on the both sides of sheet. Pages are arranged on sheet depending upon the order of pages in the book. Once the pages are arranged as per the required sequence of page numbering in book, sheet is folded. It is called as the ‘signature’ as shown Figure 4.21. Such signatures are put together in sequence using various binding techniques to form a book block.

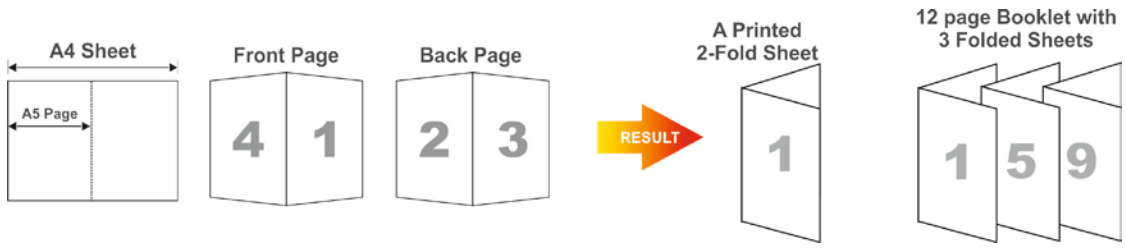


Figure 4.21: Imposition of Pages on Folded Sheets with ‘Signature’: Modern Book

Two very common types of page imposition observed in modern book design:

Type 1: Page imposition for the left side bounded books (Figure 4.22)

Type 2: Page imposition for the top side bounded books (Figure 4.23)

Following digital illustration demonstrates Type 1 page imposition system for the left side bounded books (Figure 4.22). In this case, eight pages are arranged on a sheet of paper. These pages are aligned with each other for making a ‘signature’ on both the sides of the sheet (Front and Back) in such a way that pages can be read in sequence after folding the sheet.

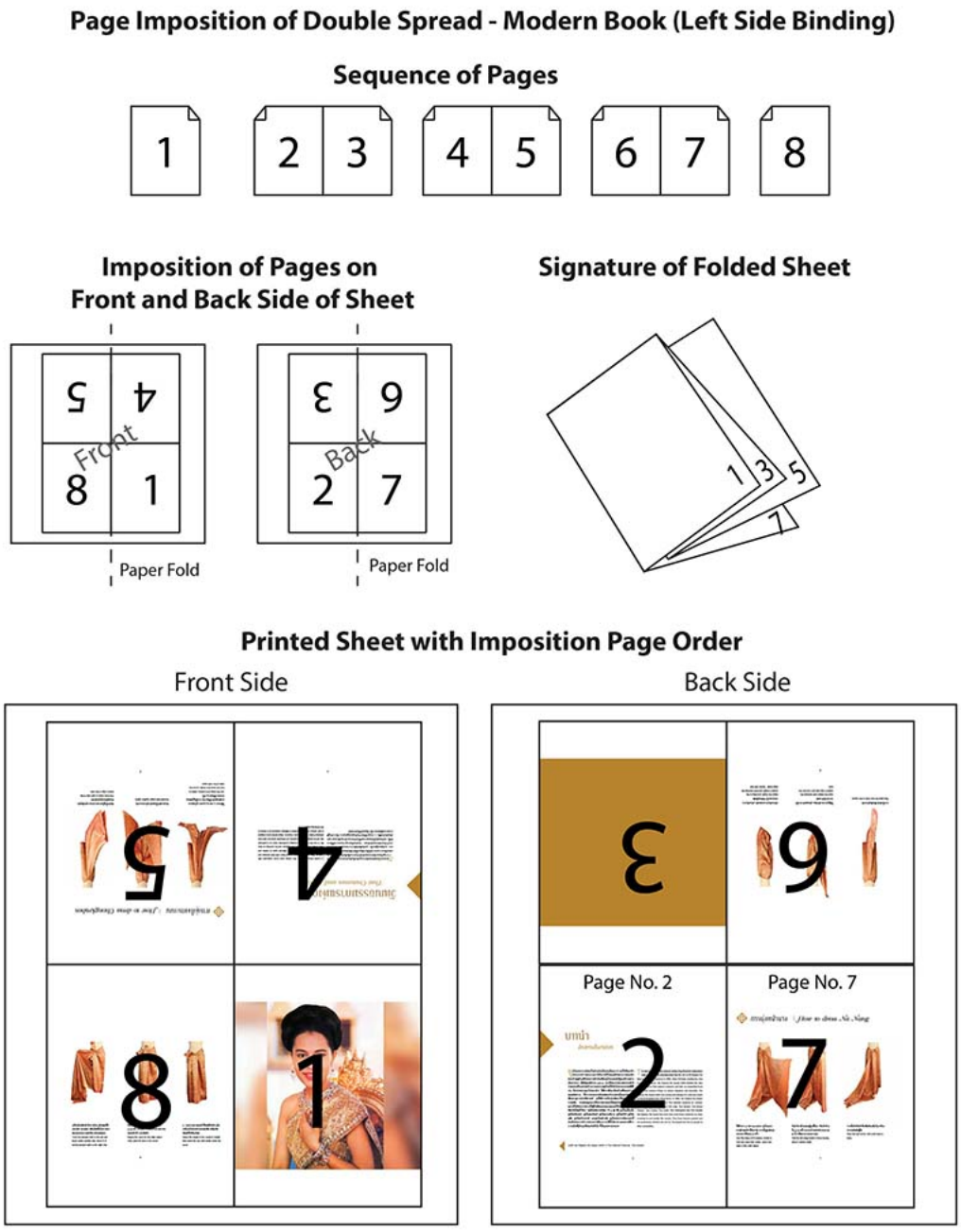


Figure 4.22: Demonstration of Page Imposition for Double Spread Type of book with Binding on Left Side, Modern Publication Design, *Thaipatra*

Following digital illustration demonstrates Type 2 page imposition system for the top side bounded books (Figure 4.23). In this case, four pages are arranged on a sheet of paper. These pages are aligned with each other for making a 'signature' on both the sides of the sheet (Front and Back) in such a way that the pages can be read in sequence after folding of the sheet.

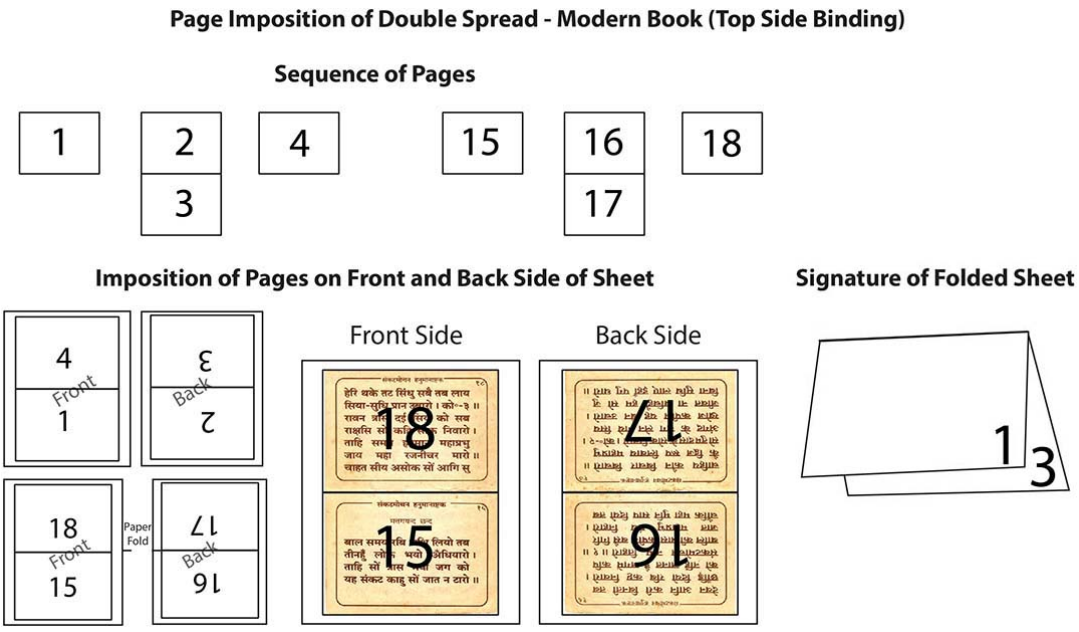


Figure 4.23: Demonstration of Page Imposition for Double Spread Type of book with Binding on Top Side, Modern Publication Design, *Shree Hanuman Chalisa*

There are various types binding techniques available to set pages together in modern book. Among them following six are most popular styles for binding modern books as shown in Figure 4.24.

1. **Case Binding** with hardcover and dust cover jacket;
2. **Open Binding** show sewn sections, create dramatic effect;
3. **Perfect Binding** where signatures are glued together along with cover page using adhesive, e.g. paperback books;
4. **Spiral Binding** in which pages lay flat when open e.g. training manuals
5. **Wiro Binding** using metal rings mainly meant for reports and corporate publications
6. **Saddle-stitch Binding** in which folded papers/signatures are stapled in the center. Cheapest and most utilitarian method most commonly used in small size booklets.

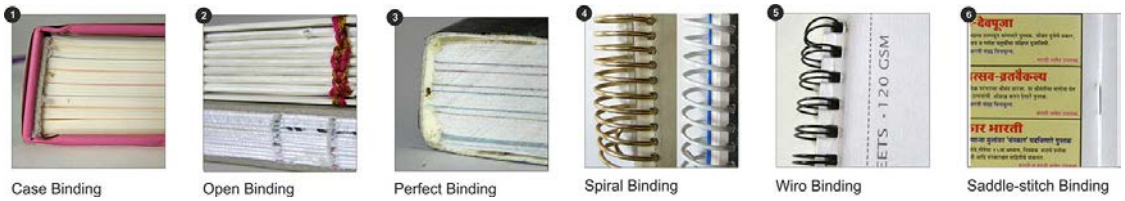


Figure 4.24: Book Binding Techniques, Modern Publication Design

4.1.4 Findings of Theme 1: Form and Function of the seventeenth century Devanagari Brahmanical Manuscripts

During the seventeenth century and before, Indian traditional style for reading and writing was to sit on the floor with crossed or folded legs. The example of such reading and writing of a manuscript shown in Figure 4.1 demonstrate that the manuscript is kept in front of a reader either on a ground or on a desk. For writing purpose, the use of a small desk was in practice.

4.1.4 (a) Page Formats of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

A. Total 230 Devanagari Brahmanical manuscripts of the seventeenth century scrutinized from various repositories to understand their formats. Interestingly, the result of this endeavor makes evident that only two types of page layout formats were prevalent for writing manuscripts. These formats are (i) landscape and (ii) portrait.
B. Out of total 230 manuscripts, 228 manuscripts are found in the landscape format, i.e. horizontal orientation. In the landscape layout format, the proportion of the width is more than the height.
C. Only two manuscripts, out of total 230 manuscripts, are found in the portrait format i.e. vertical orientation. In the portrait layout format, the proportion of the width is less than the height.

The above observations indicate that preferred format for writing a manuscript in the seventeen century was oblong-shaped landscape layout format. A very few number of portrait formats prove that manuscript designers were reluctant to change a standard landscape layout format. However, very few designers did think differently, and showed their explorative nature and, they delved into an unusual vertical page format.

Among the representative manuscript selected for the study, one of them namely "*Shree Samarthakrut Yuddhakandachi Prat*' in the custody of the 'Samartha Vagdevata Mandir', Dhule, Maharashtra is of portrait format, i.e. vertical orientation and is one among the rarest format used in the seventeenth century.

4.1.4 (b): Page Sizes of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

Representative manuscripts analyzed to study the width and height aspect ratio. Observations did not detect any standard aspect ratio between width and height. The manuscript size-range recorded in Table 4.2, shows following results:

- In the case of the landscape type of manuscripts, the width of manuscripts is varied between 6" to $13^{3}/_{4}$" and height from $4^{1}/_{2}$" to $8^{1}/_{2}$". (see Table 4.2)
- In portrait type of manuscripts range of width- size found between $4^{1}/_{2}$" and $8^{1}/_{4}$" and, height range between 7" and $9^{1}/_{2}$". (see Table 4.2).

The only two vertical manuscripts found in this survey are of following sizes: (i) $4^{1}/_{2}$" x 7" and, (ii) $8^{1}/_{4}$" x $9^{1}/_{2}$"

However, a few unique manuscripts are found at various repositories of the types suggested by scholars in manuscriptology. They are of following sizes and types:

(i) ***'Gutka'*** type, a small size manuscript, namely *Sachitra Pancharatna Geeta*, Acc. no. 628, with size $6^{1}/_{2}$" x $4^{1}/_{2}$", and one more manuscript of this type with Acc. No. 629 and size 5^{3}/4" x 3.15" (Samartha Vagdevata Mandir, Dhule, Maharashtra)

(ii) ***'Musti'*** type, it can be held in the fist of hand (Acc. no. 694) - size $1^{1}/_{2}$" x 4" (Samartha Vagdevata Mandir, Dhule, Maharashtra)

(iii) '***Pustika***' type, such manuscripts are available at Deccan College Post Graduate and Research Institute, Pune. Their width is approximately 7" and height is around 5" (Acc. No. 4071- 1654 AD, 5953 - 1667 AD, 6142, 1636 AD, 10872 - 1667 AD, 10917 - 1651AD).

4.1.4 (c): Page Formats and Sizes of the Modern Publication Designs

In modern publication designs, books with three different formats noticed: Portrait, Landscape, and Square.

Modern books are designed in the various sizes. Their sizes may vary but they are fitted under different sections, formed by folding pages of ISO standard paper sizes, e.g. A, B and C series. An ‘A0’ size paper can be folded into A1, A2 A3, A4, A5, A6, etc.

(Figure 4.5). This is a convenient system for maximum utilization of paper without any wastage. A4 paper size is the most preferred size for books and magazines.

Modern graphic designers decide the size of the book based on its function, e.g. a small pocket size is preferred for holy books as shown in Figure 4.10, and the instruction manuals are mainly of pocket size or smaller than pocket size. They are portable and easy to carry while traveling and subsequent reading. However, academic or leisure reading book sizes are in the range of 5-6" width and their height is up to 9". Coffee table books and the reference books are bigger in size, sometimes bigger than A3 size because they are supposed to be viewed and appreciated visually instead of reading. To sum up, modern books are designed in various sizes i.e. small pocket size books to big reference books.

4.1.4 (b) Page Turning System, Text flow, Orientation of Text and Eye Movement of the Reader

Page Turning System

Total space occupied when the manuscript folio is flipped, measured approximately along with a comfortable distance between two folios is recorded in the current experiment. It is recorded in Table 4.3 and 4.4 shown below. This experiment has disclosed that the total space occupied by the turned folios flipped in the vertical or horizontal direction as shown in Figure 4.12. In addition to this, the experiment has thrown light upon the reading pattern for the current and previous page.

Table 4. 3: Area Occupied by Flipped Folios (Landscape Format)

Manuscript Size	**Width and Height Ratio**	**Scenario 1** Folios Flipped in Vertical direction	**Scenario 2** Folios Flipped in Horizontal direction
Width 11.3" Height 4.5"	Approx.2.5: 1	Width 11.3" Approx. Height 9"	Approx. Width 23" Height 4.5"

Table 4. 4: Area Occupied by Flipped Folios (Portrait Format)

Manuscript Size	**Width and Height Ratio**	**Scenario 3** Folios Flipped in Horizontal direction
Width $4^1/_2$" Height 7"	Approx. 1 : 1.55	Approx. Width 10" x Height 7"

Scrutinizing of the manuscript through digital experimentation divulges that:

A representative manuscript selected to conduct an experiment in Scenario 1 and 2 is of landscape format with a width almost two and half times bigger than the height.

i) **Scenario 1**: In the process of reading the manuscript, already read folio turned in the upward vertical direction of the current folio. (Figure 4.12/Table 4.2). Using this pattern for turning the folios, the horizontal approximate width remains the same as the width of the manuscript and doubles the height distance. In current experiment approximate vertical distance, which includes previous and the current page is 9", i.e. twice the height of manuscript. Ergonomically, this possibility of distance creates convenience for the reader in turning the page in the vertical direction.

   In addition, it is observed that eye movement is very much comfortable for looking content from the previous page. This is because the eye moves unidirectional i.e. vertical direction only. This type of vertical arrangement of folios assists in creating continuity in the text flow.

ii) **Scenario 2**: In the process of reading the manuscript, already read folio turned towards the right side of the current folio in the horizontal direction. (Figure 4.12/Table 4.2). Using this pattern for turning the folios, the vertical height of the current folio and the previous folio remains same but the horizontal distance doubles. The approximate total width turned out around 23". To work with such an oversize width is beyond the normal ergonomic capacity of human being.

   This type of horizontal arrangement of folios creates a challenging situation for the reader in terms of text flow. In addition, it makes the eye movement direction complicated while referring the previous folio. Disruption in the continuity occurs because of zigzag eye movement.

In addition to findings in Scenario 1 and Scenario 2, considering fragile nature of the material used for writing the manuscript, i.e. paper, it is very much essential to use both the hands to lift and flip the folio as shown in Figure 4.11.

iii) **Scenario 3**: A representative manuscript selected to conduct an experiment in Scenario 3 is of portrait format with height almost one and half times bigger than the width.

   In the process of reading the manuscript, already read folio turned towards left side in the horizontal direction (Figure 4.12/Table 4.3)

The vertical height of the current folio and previous folio remains same but the horizontal approximate total width turned around 10".

Although, this type of horizontal arrangement of folios creates a zigzag eye movement but the order of the text or information remains from the left to the right (from the previous folio to current folio). Reading pattern shows equivalence to the Devanagari script that is from the left to the right direction. This pattern of reading is convenient for the reader in case there is a need to refer to the previous page.

Text Flow Directions

Page turning pattern followed in the seventeenth century Devanagari Brahmanical manuscripts, in which folio is turned in the vertical direction, influenced the orientation of the text on the sides of the folio. The orientation of the text as seen in Figure 4.15 shows the reverse direction of the text on both the sides of the manuscript folio. It is complementary with the top side bounded Group 1 type of modern publication designs Figure 4.16.

Eye Movement of the Reader

Digital experiment conducted to study modern publication design has revealed that the text flow patterns found in Group 1 books (top side binding and single column page layout) is in vertically downward direction, and it is corresponding to the system of manuscripts of the seventeenth century. In Group 2 and Group 3 (left side binding and multiple column page layouts), text flow direction is in a zigzag direction, sometimes horizontal, vertical and angular zigzag but still it is in the direction from left to right and creating a dynamic pattern. Since reading the pattern of all Indian scripts are in the same direction i.e. left to right, the reader finds it very much convenient with the system.

4.1.4 (c) Page Imposition and Binding System

- All manuscripts are in the form of a bunch of separate folios made of paper.
- No holes or piercing on paper is noticed in the seventeenth century Devanagari Brahmanical manuscripts.
- No extra case or wooden planks are found to bind them together.
- Each manuscript is wrapped up in a cloth and tied with a cotton string.

In modern books, numerous types binding techniques are in practice, which are from basic utility oriented stapling to expensive case binding. Imposing technique is followed

in printing by arranging many pages on a big sheet of paper as shown in Figure 4.22 and 4.24. This big sheet of standard size paper is folded to make signatures, which create a possibility of printing many pages on a single sheet as shown in Figure 4.21. These signatures are bound together by means of various section-binding techniques. Case binding, open binding, perfect binding, spiral binding, wiro binding, saddle-stitch binding are the most popular binding techniques today (Figure 4.24).

4.1.5 Comparative Analysis of Forms and Functions of Representative Seventeenth Century Devanagari Brahmanical Manuscripts

4.1.5 (a) Page Formats

A distinguishable factor has been noticed while comparing the above observations of the seventeenth century Devanagari Brahmanical manuscript formats with the modern publication designs.

- In the case of manuscripts, most preferred format is landscape, only two manuscripts found out of 230 which are in portrait format. However, the modern graphic designers judiciously use three formats for page layouts, and their sizes are with respect to the ratio of the page width and the height. These formats are a portrait, landscape, and square. Most preferred format found is the portrait over the landscape. The square page format did not often used. No matter what the size of the book is, the ratio has been considered most, and accordingly they adopted the three categories mentioned above. The book sizes available today are in a variety of sizes as per their functional requirement.
- While comparing sizes of the seventeenth century Devanagari Brahmanical manuscripts and modern books, it is observed that no standardization of sizes discovered in the former as it is seen in modern publication design practices, e.g. ISO standard paper sizes.
- Although the sizes of the paper were not standardized in the seventeenth century, various nomenclatures were predefined for the manuscripts, depending upon their form, size, and function, e.g. *Mushti, Gutka, Pustika, Potho*, etc. A reader can hold *Mushti* type manuscript in the fist. *Gutaka* is a center stitched manuscript, which is larger than *Mushti*. *Pustika* is still larger size of manuscript and the size of *Potho* manuscripts have more leaves and they are thicker than *Pustika*.

4.1.5 (b) Page Turning System, and its Association with Placements of Turned Pages

This experiment is conducted in three different scenarios which exposed similarities in the seventeenth century Devanagari Brahmanical manuscripts and modern books in terms of page-turning, text flow, and eye movement. It is justified as follows:

i) A similarity between page turning systems is noticed on the top side bounded, single column, Group 1 type of books (Figure 4.16) and the manuscripts with Figure 4.12 - Scenario 1. In this system, while reading a manuscript, folios are turned in the vertical direction, and the turned folio is placed towards the upward direction of the current folios. Page layouts formats of such of books and manuscripts are in landscape format.

ii) Modern book pages turning system and text orientation direction are complementary with the manuscripts as seen in Scenario 1 (Figure 4.12). The only difference noticed in the modern books is that their pages are bound together with the various types of binding techniques as seen in (Figure 4.24), whereas in the case of manuscripts they comprise of loose sheets of folios.

iii) A similarity between page turning systems is noticed on the left side bounded single and multiple columns, Group 2, 3 type modern publication designs (Figure 4.17 & 4.18) and the seventeenth century Devanagari Brahmanical manuscripts as represented in Scenario 3 (Figure 4.12). In this system, while reading a manuscript or a modern book, the folios are turned in a horizontal direction towards the left side of the current folio. This is the most common page turning system adapted in modern books, borrowed from portrait format manuscripts.

4.1.5 (c) Page Imposition and Binding System

Similarities are found in the imposition system of the single folio, double spread manuscripts with the single, and double spread top side bounded modern publication designs.

In the case of a manuscript binding system, which comprises of loose folios wrapped in a cloth, provides ease of portability but does not provide ease in reading. For reading purpose, the reader has to sit down and read it in the traditional manner as shown in Figure 4.1.

However, various types of modern book sizes and binding techniques have brought an ease in holding a book in hand and in portability as well. The reader need not have to sit in a particular posture as in the case of reading a manuscript made of loose folios, instead a reader can enjoy the hassle free reading even in a journey or traveling.

4 .2 Theme 2: Composition and Layout Design: Page Structure, Typography, and Graphic Strategies

Composition means organized arrangement of various design elements, such as text, images, graphics, etc. to make a layout. Fundamentals of design help in making cohesive and spatial arrangements between the content used in the design. It is achieved with effective placements, alignments, division of space, grouping, visual flow, etc. The composition should be effective and functional.

4 .2.1 Aims and Objectives

To identify elements dependable for composition and layout of the seventeenth century Devanagari Brahmanical manuscripts, and compare their design concepts with the modern book designs.

The objectives of study for this ‘Theme 2’ are to explore the organization of design elements on a folio of the seventeenth century Devanagari Brahmanical manuscripts. This study will explore:
(1) Anatomy of a Page, (2) Grid System, (3) Typographic Palette — Type Style and Paragraph Alignments, (4) Graphics Strategies

4 .2.2 Approach to Study Composition and Layout Design of Devanagari Brahmanical Manuscripts and Modern Books

Manuscripts are collected from various repositories with common and uncommon layout design patterns and are of various genres. Selective few are identified for the study. These representative manuscripts are scrutinized in the current study for testing of the hypothesis.

H_0 -1 A structure of manuscripts contains many elements which are continued in a modern publication design

H_0 -2 Devanagari Brahmanical manuscript designers have their distinct system, style, and pattern for designing manuscripts.

H_0 -3 Devanagari Brahmanical Manuscripts designers believed in simplicity and hence they focused on the content of the text and used minimalistic approach to other factors such as decoration and ornamentation.

Modern books, which comprise all possible design aspects, have been selected as a representative sample. Further layout and composition related aspects of the manuscripts and the modern books compared under various heads as described in 'Aim and Objectives'.

4.2.3 (a) Page Anatomy — Structure of a Page

The structure of any publication comprises page anatomy. A page anatomy includes margins, columns, text block area, header, footer, grid system, baseline grid, and elements of page navigation system such as running titles, page numbers, etc.

Approach to Study Structural Page Layout Components of Devanagari Brahmanical Manuscripts and Modern Books

4.2.3 (a1) Page Anatomy of the Manuscripts with Structural Page Components

Total eleven representative manuscripts selected to examine page structure of the seventeenth century Devanagari Brahmanical manuscripts from various repositories of Maharashtra, namely the Deccan College Post Graduate and Research Institute (5), Anandashram Sanstha (3), Vedic Samshodhan Mandal (1), Bhandarkar Oriental Research Institute (1), Samartha Vagdevata Mandir (2). The common features have been observed related to page structure in the above-mentioned manuscripts, documented in a visual manner.

The manuscripts with the various layout styles and subjects are selected to understand the page structure, their components, and information system design features. The manuscripts of various genres with varied layouts are selected for the study. Observations documented in a visual deconstruction method.

Details of Representative Manuscripts:

Manuscript Title	**Physical Description**
Kundamartandatika	Orientation: Landscape
Acc. No. 10287 DC, 1691 AD	Size of Manuscript: Width 21.5 x Height 10.5 cm
	The Ratio of Width and Height: Approx. 2.05 : 1

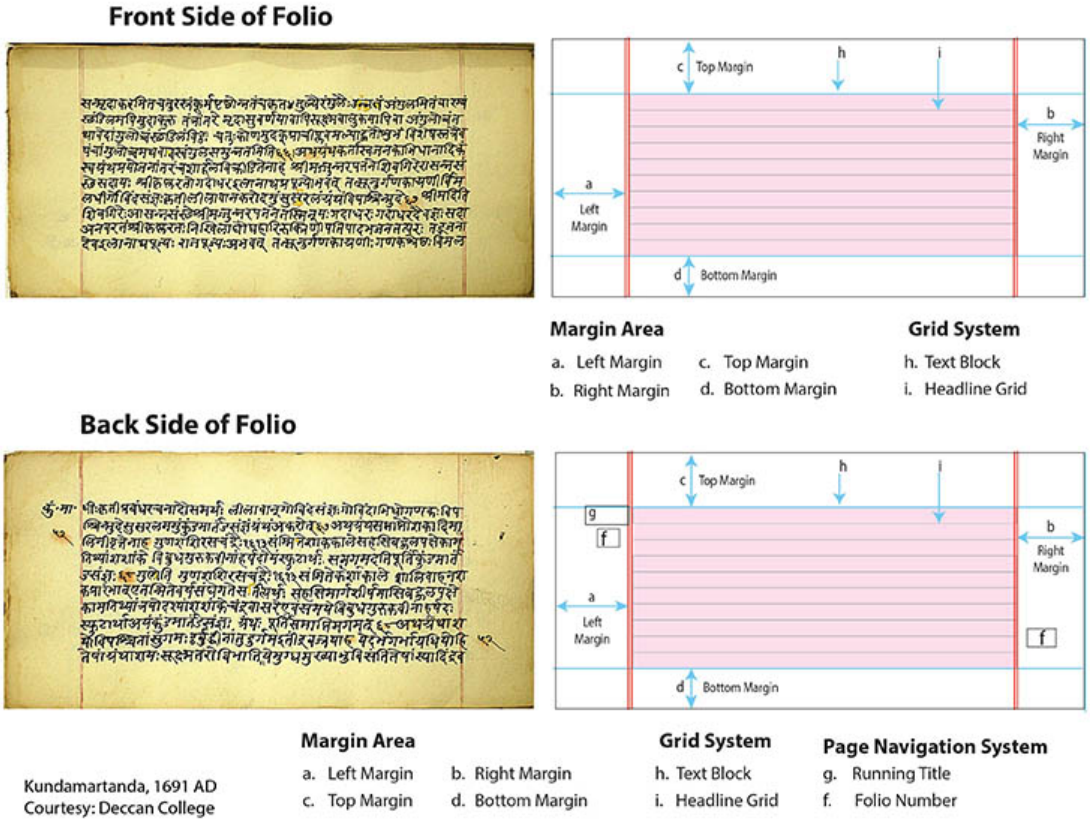


Figure 4. 25: Basic Structural Components of the Folio with Digital Illustration - Seventeenth Century Devanagari Brahmanical Manuscripts

4.2.3 (a2) Page Anatomy of Modern Book with Structural Page Components

A basic component which makes a structure of modern book has been discussed with the help of following examples. The first example represents a single column page layout as shown in Figure 4.26. The second example represents double open spread page layout with multiple columns, which comprises left (verso) and right (recto) page (Figure 4.27).

Details of Representative Modern Book with Single Column

Book Title	**Publisher**	**Publication Year**	**ISBN No.**
The Elements of User Experience	Pearson Education	2011	13: 978-0-321-68368-7 10: 0-321-68368-

If the case of single page layout, a horizontal page margin is called as the left and the right margins.

If the page is double spread then horizontal margins are called as the inside and outside instead of the left or the right margin.

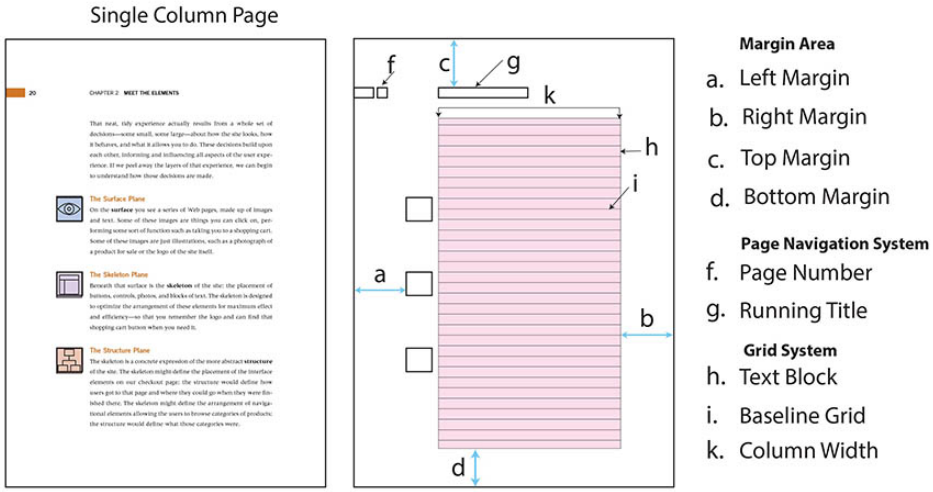


Figure 4.26: Page Anatomy of Single Columns Page Layout, Digital Illustration, Modern Publication Design

Details of Representative Modern Book with Multiple Columns Layout (Figure 4.21):

Book Title	Publisher	Publication Year	ISBN No.
International Marketing - Analysis and Strategy	Routledge	2004	0–415–31132–2 (hbk) 0–415–31133–0 (pbk)

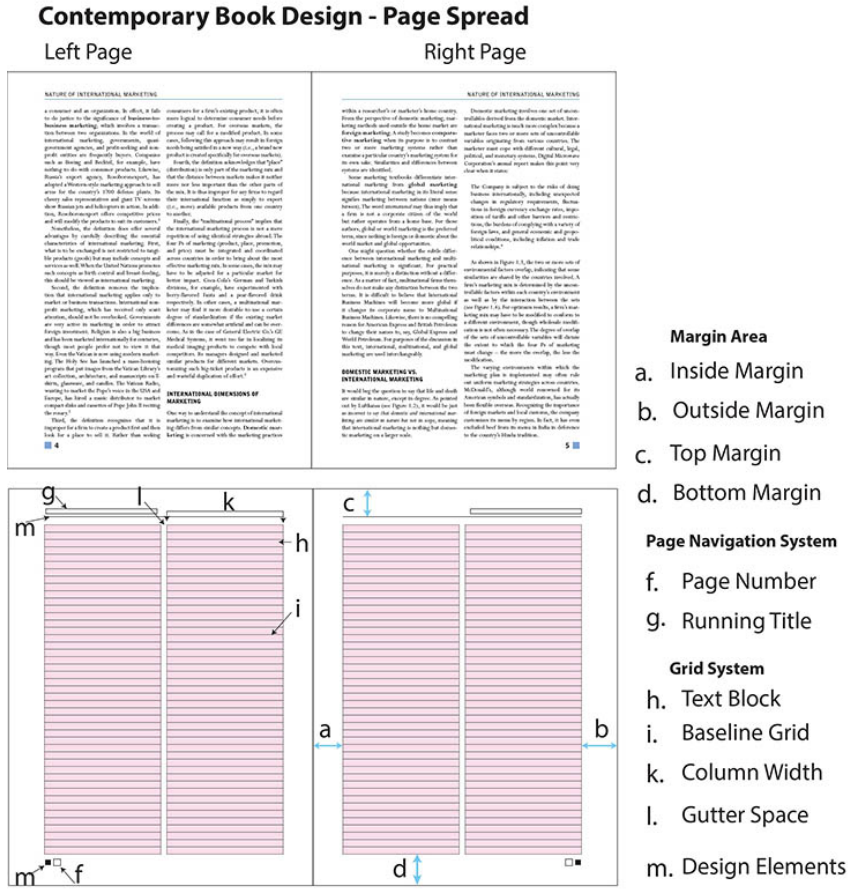


Figure 4.27: Page Anatomy — Multiple Columns and Mirror Image type Page Layout, Digital Illustration, Modern Publication Design

4.2.3 (b) Grid System in the Page Layouts of the Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Books

Grid is made up of margins, columns, flowlines that break the horizontal space. It creates various spatial zones to place various elements such text, images, and other information on the page.

4.2.3 (b1) Grid Construction Methods of the Seventeenth Century Devanagari Brahmanical Manuscripts

Approach to the study Grid System and Layouts

Four types of representative manuscripts are selected to understand the grid structure, margin area and position of the text block for the page layout. The entire process of understanding grid and structure of manuscript is explored through 'Digital Visual Representation Method'.

Following types of representative manuscripts selected for the study:

Type 1: Manuscript with a single column and a single folio layout format
(Single text block, landscape format, text oriented)

Type 2: Manuscript with a single column and a double spread page layout format
(Single text blocks, landscape format, text, and image)

Type 3: Manuscript with a variation in text blocks sizes; landscape layout

Type 4: Manuscript with single text block; portrait layout format

4.2.3 (b1) - Type 1: Grid Construction of a Manuscript with a Single Folio Layout Format

The content of a representative manuscript is selected for this study comprises only text. This manuscript has a single folio and a text block made up of a single column.

Details of manuscript as below:

Type 1: Manuscript with Single Text block
Manuscript Title: *Ranganath Virachit 'Chitsadanadalahari' Tika*, 1698 AD
Library Details: Bharat Itihas Sanshodhak Mandal, Acc. No. 39,125
Physical Description
Orientation: Landscape Layout Format
Size of Manuscript: Width 245 mm x Height 120 mm
Genre: Religious

Investigation to understand the layout grid structure of '*Ranganath Virachita 'Chitsadanadalahari' Tika'* manuscript, revealed following steps in grid formation and page designing (Figure: 4.28)

Step 1: Defining a specific size for manuscript writing.

Step 2: Divide space on the page into modular divisions to create columns and rows (8 columns & 6 rows).

Step 3: Use of outside one unit field to define a margin area (left, right, top & bottom margin: a, b, c, & d respectively as shown in Figure 4.28). 'h' is the text block area.

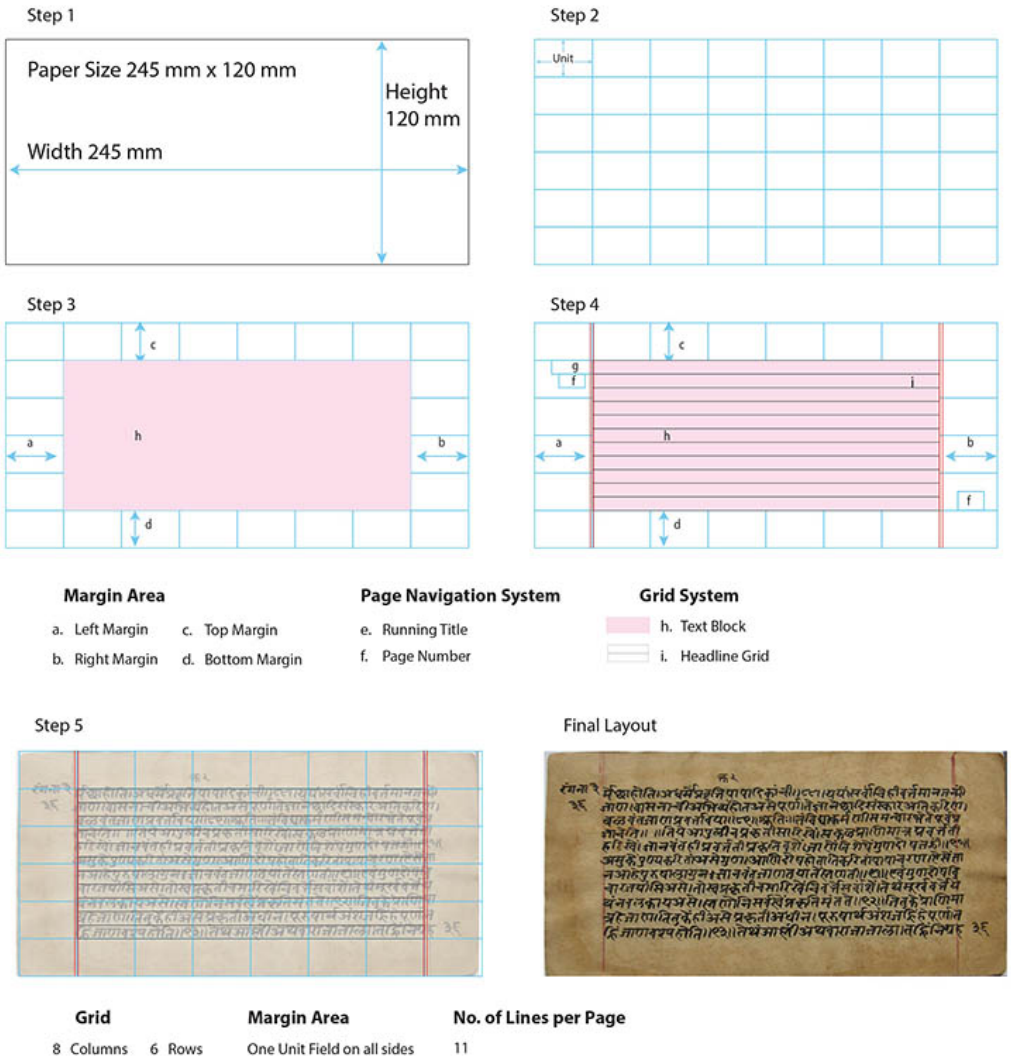


Figure 4.28: Digital Illustration — Grid Construction of a Single Folio Text Oriented Manuscript

Step 4: Divide 'h' i.e. a text block area into a number of parallel lines (Figure 4.28). The distance between these lines decided as per the height/size of the character to be written on the same. Define space for folio number, running title, and section title. Mark

impression on these parallel lines with the help of a pointed stylus. This entire process helped in making a page template ready with a headline grid, running title and folio number.

Step 5: Using the template created earlier, complete the writing on a page as shown in final layout (Figure 4.28).

A Different Approach in Headline Grid Construction

Following two specimens methods are practiced to create headline grid. They are different from the method discussed in Type 1 (Figure 4.28 - Step 4). Manuscripts details are as below:

Type.	Manuscript Details
1	*Patanjali Mahabhasya, DC, Ac. No817 1653 AD*
2	*Samarthakruta Ramayana, SVM,* Anandashram, Acc No. 746, 1623 AD

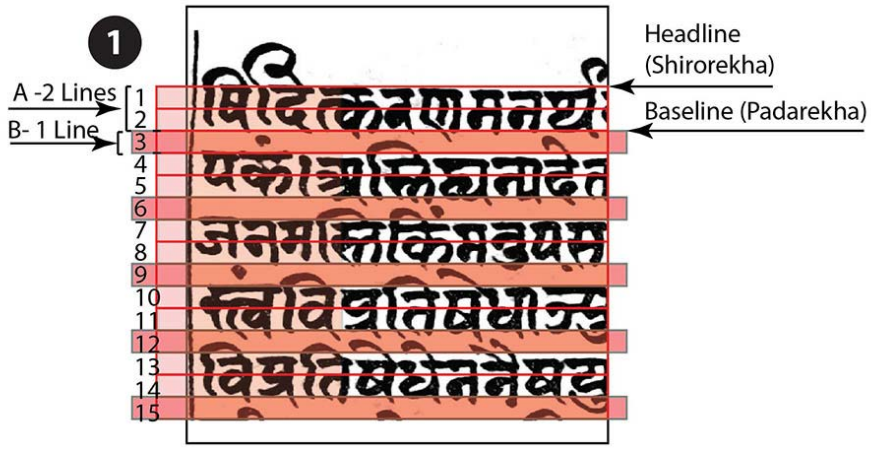


Figure 4.29: Typography, Headline Grid, and Formation of Leading Space (Type 1), Seventeenth Century Devanagari Brahmanical Manuscripts

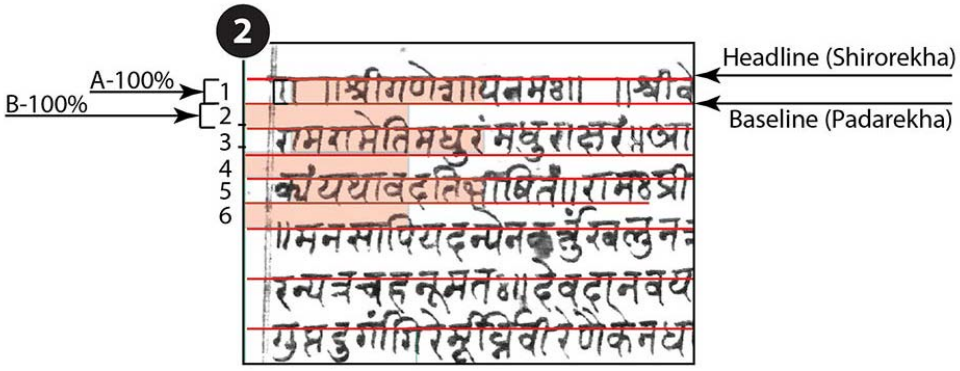


Figure 4.30: Typography, Headline Grid, and Formation of Leading Space (Type 2), Seventeenth Century Devanagari Brahmanical Manuscripts

In above specimen (Figure 4.29) Four-line grid unit used to write text. The text is written in the first and second part of the unit. The third part is left blank as a leading space between two successive lines. The second line is written using fourth and fifth parts. Sequence continued for writing rest of the text.

In above specimen (Figure 4.30) Three-line grid unit is used to write text. The text is written in the first part of the unit. The second part is left blank as a leading space between two successive lines. The second line is written using a third unit. Sequence continued for writing rest of the text.

4.2.3 (b1) - Type 2: Grid Construction of a Manuscript with a Double Spread Page Layout Format

The content of a representative manuscript selected for this study comprises text and image. This manuscript has a double spread folios and text block made up of a single column.

Details of manuscript as below:

Type 1: Manuscript with Single Text block
Manuscript Title: *Kundamartanda - Suprabha Vyakhya by Anant Daivadnya*, 1688 AD
Library Details: Anandashram, Acc. No. S 21-1-18
Physical Description
Orientation: Landscape Layout Format
Size of Manuscript: Width 290 mm x Height 120 mm
Genre: Architecture

Investigation of layout structure of pages of '*Kundamartanda - Suprabha Vyakhya'* manuscript, revealed following steps in grid formation and page designing:

Step 1: Selection of a paper / sheet with a specific size for manuscript writing. (Figure 4.31)

Step 2: A sheet is folded once to create two leaves and four pages. (Figure 4.31)

Step 3: A sheet fold has defined the page imposition on the page along with the placement and direction of pages. (Figure 4.31)

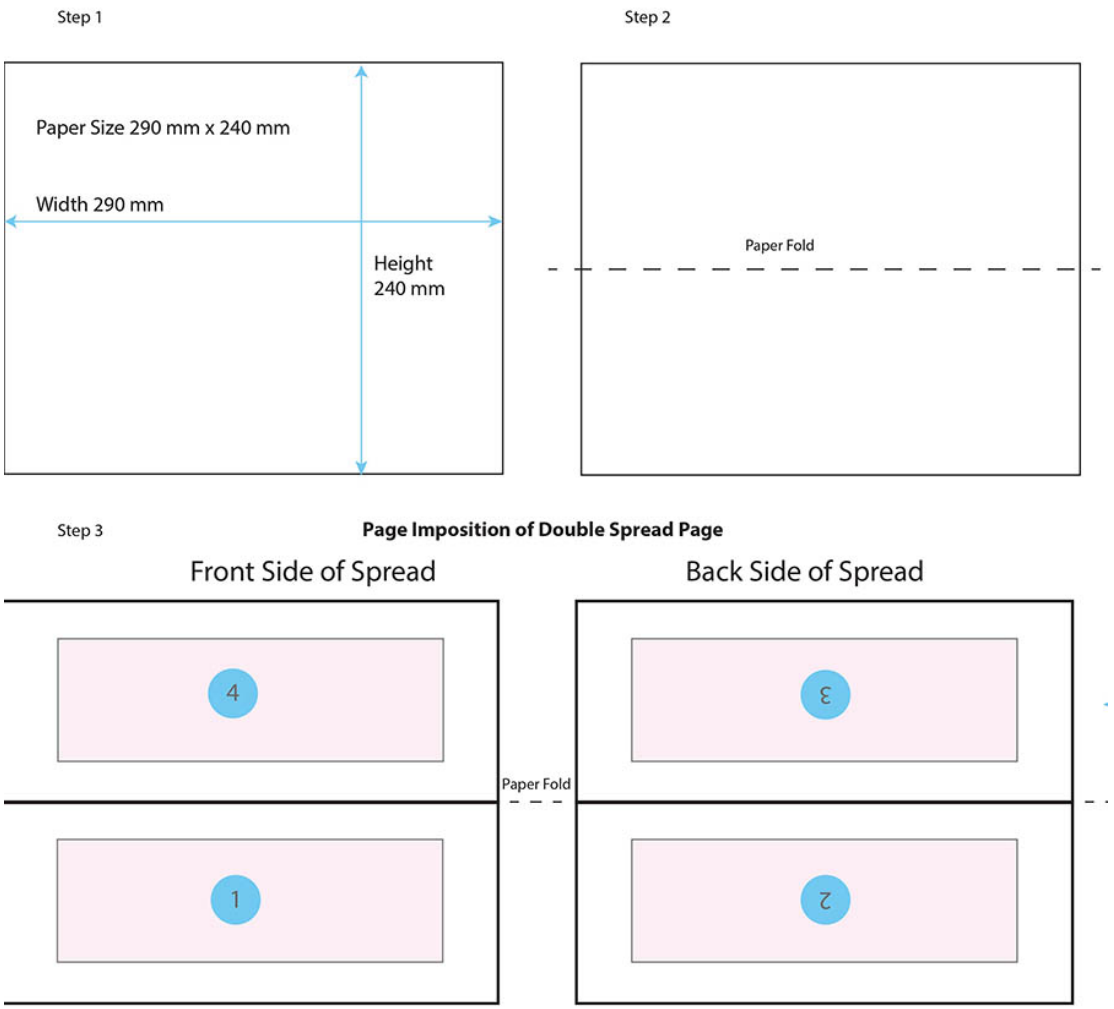


Figure 4.31: A Digital Illustration of Manuscript with Double Spread Paper Size and, and Imposition of Pages on Front and Back Side of Folio

Step 4: The horizontal space is divided into nine columns of equal width. The vertical space is divided into five rows of equal height (Figure 4.32). This division has defined an area for the 'text block' and 'margin' within the page layout. This procedure has created an intersection of columns and rows resulted in formation of a modular grid consisting of a number of units. One unit area from all sides utilized as a margin area i.e. left, right, top and bottom respectively. This process has also defined a text block area, denoted by 'h'.

Step 5: To define an area for the margins and the text block area, a simple process followed i.e. one unit field space of outer side, defined as margin (a, b, c and d) and inside area i.e. 'h' is considered for as text block area. Figure 4.33 shows two pages of spread with symmetrical margins and text block area.

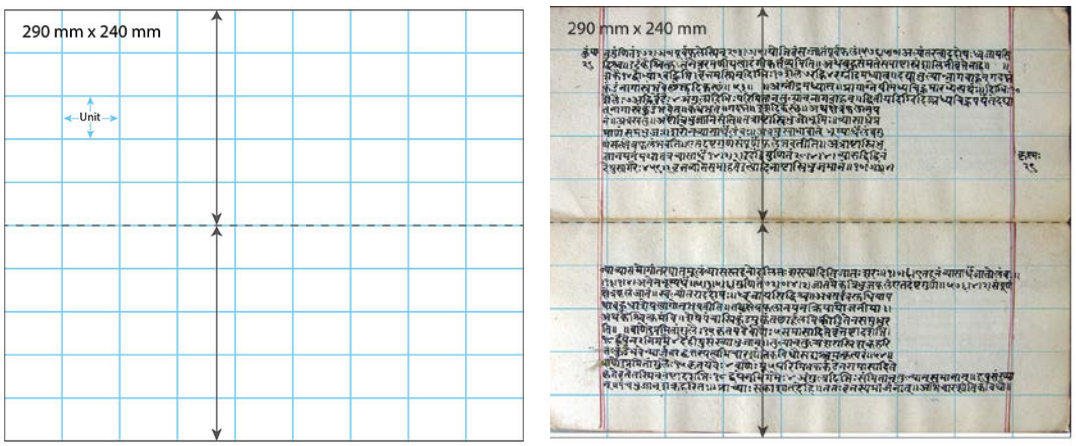


Figure 4.32: Digital Illustration and Manuscript of Modular Grid Formation

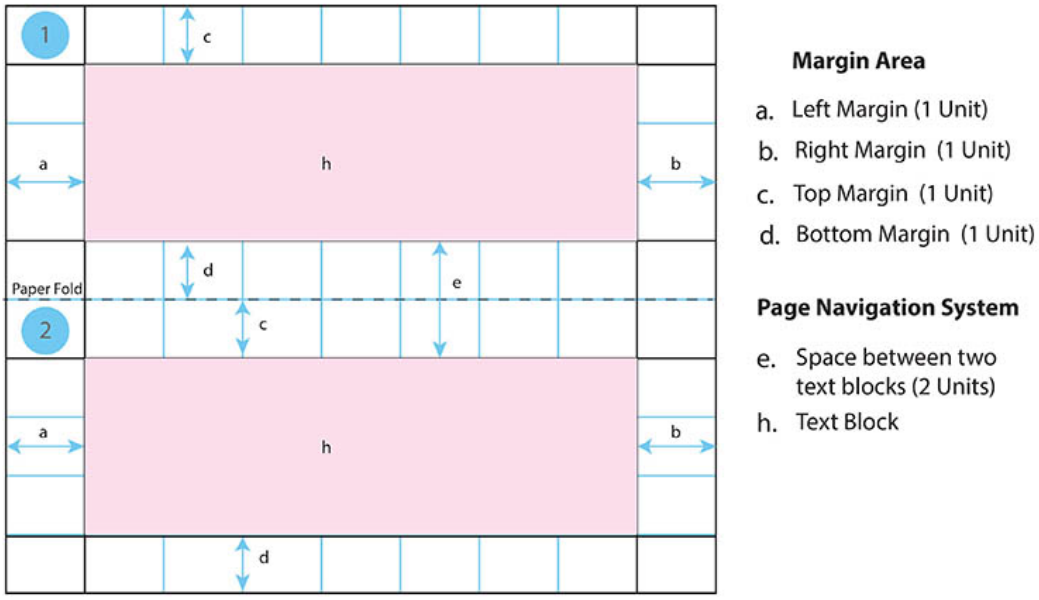


Figure 4.33: Digital Illustration showing Defined Area for Margin and Text block on a Manuscript Page

Step 6: Draw borders in order to physically indicate margin on the left and the right sides of the page. To define these guidelines for width of text, one unit space is utilized from left and right side of the page. (Figure 4.34)

Step 7: Headline grid for the text area created by deciding the type size and leading space i.e. space between two successive lines as shown in Figure 4.34. Horizontal grid is constructed within the text area by dividing it into 11 equal parts to accommodate 11 lines of text per page. Mark impression on these eleven parallel lines with the help of a pointed stylus. This entire process helped in making a page template ready with a headline grid, running title and folio number. The size of character and leading space defined in this process. The size for the image area is also decided by utilizing two-unit

horizontal space and six vertical headlines space. Thus, image area is aligned to the bottom of text block. (Figure 4.35)

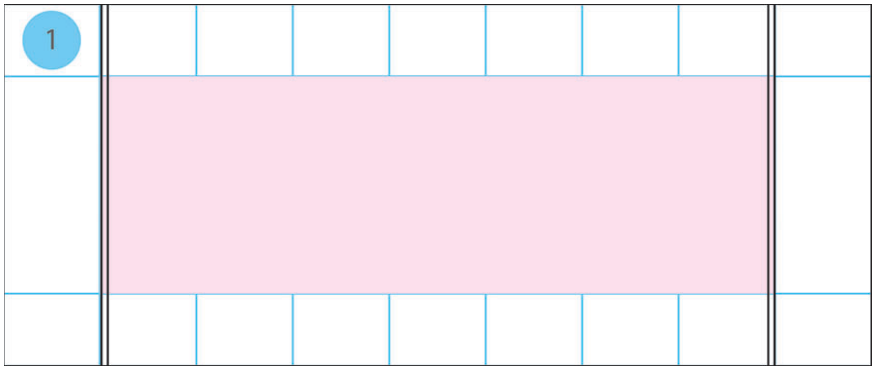


Figure 4.34: Digital Illustration of Boundary Lines on the Left and the Right Margins

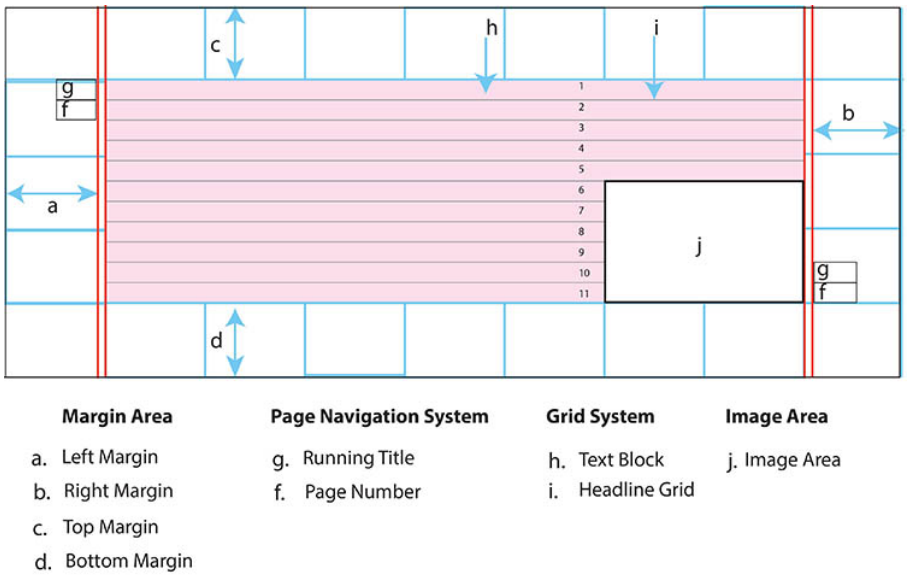


Figure 4.35: Digital Illustration - Grid Deconstruction with Defined Margins, Headline Grid, Page Navigation System and, Image Area

Step 8: Using the template created earlier, complete the writing on a page (Figure 4.36)

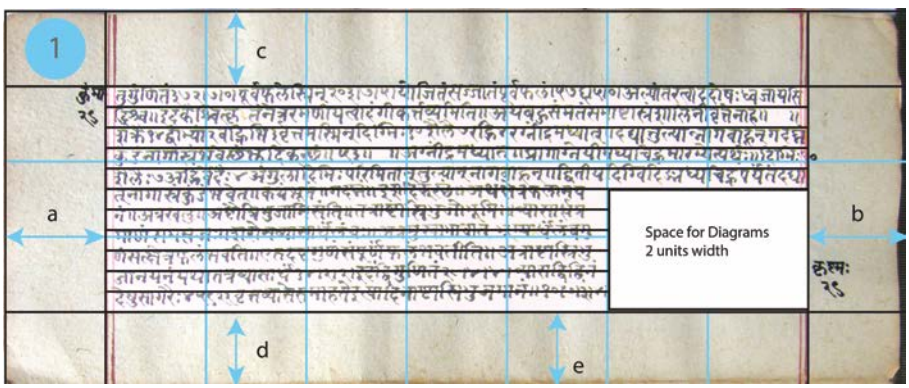


Figure 4.36: Digital Illustration showing Superimposition of Grid Structure, and Manuscript Page

4.2.3 (b1) - Type 3: Grid Construction of a Manuscript with a Landscape Layout Format and Variations in the Text Block Sizes

Type 2: Manuscript with Multiple Text Blocks with Variation in Sizes
Manuscript Title: *'Ragavibodh'*, 1616 AD
Library Details: Anandashram, Acc. No. S 23-1-3
Physical Description
Orientation: Landscape Layout Format
Size of Manuscript: Width 245 mm x Height 145 mm
Genre: Music

A manuscript selected for observation is of *tripatha* style. In such manuscripts layouts, the text is written in three horizontal parts. Generally, *mula* i.e. main text is written in the middle portion and the commentary is written in the top and bottom portions of the page as shown in the following example. (Figure 4.37)

Following digital illustrations represent a critical analysis of grid formation process of '*Ragavibodh'* manuscript to design a template page.

Step 1: Selection of a paper with a specific size for manuscript writing.

Step 2: Later horizontal and vertical space are divided into a number of parts to define text and margin areas within the page layout. This process has created a number of columns with equal width and rows with equal height. The intersection of columns and rows has resulted in formation of a modular grid consisting of a number of units. In current exercise, 8 columns and 6 rows are created (Figure 4.37). One unit area from all sides decided as a margin area i.e. left, right, top and bottom respective. This process has also defined a text block area 'h'.

Step 3: The top and the bottom row of a text block, 'h' area further divided into 3 lines each. This is grid construction for musical composition area (Figure 4.37).

Step 4: Two horizontal rows of units in the middle portion of text block area, 'h' has been identified for musical notation. These two rows are broken horizontally into six columns and vertically into six rows. The top and the bottom parts of these six horizontal lines or rows left as a margin between the top and the bottom portions of 'musical composition' area. Thus, a page layout is created with two different layout grids; one for the musical composition and other for the musical notations area.

Impressions are marked on these parallel lines with the help of a pointed stylus. This entire process has aided in making a page template ready with a headline grid, and folio number (Figure 4.37).

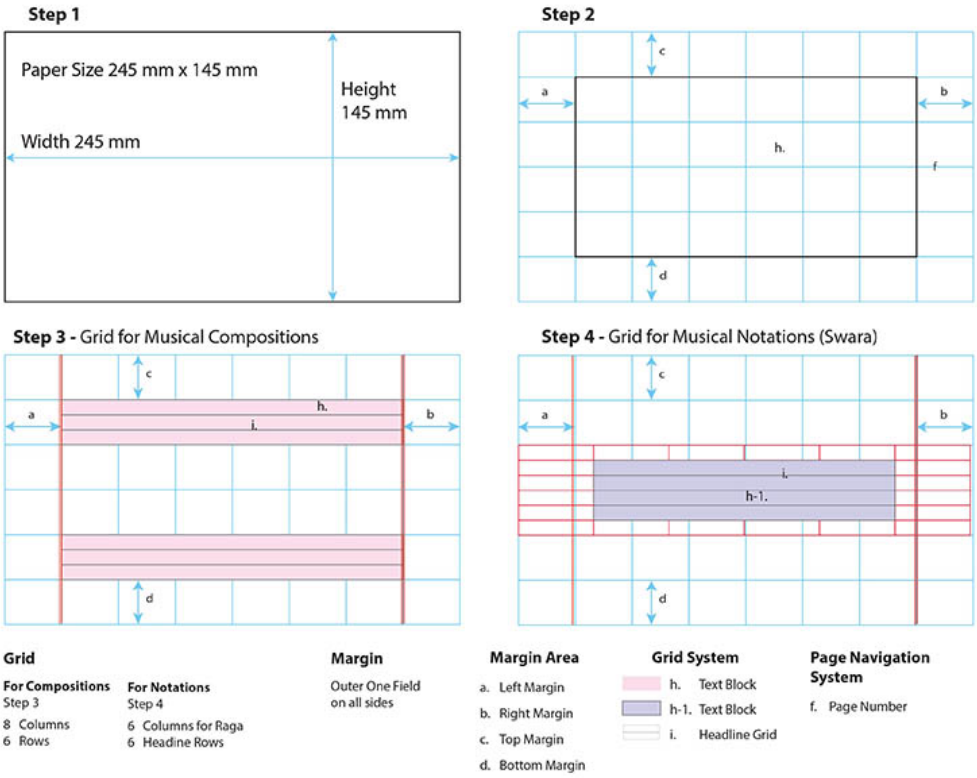


Figure 4.37: Digital Illustration of Grid Construction of a Manuscript with a '*Tripatha*' Page Layout

Step 5: A place in the vertical center, right margin area determined for writing folio number. (Figure 4.38)

Step 6: Using the template created earlier, completed the writing on a page (Figure 4.38)

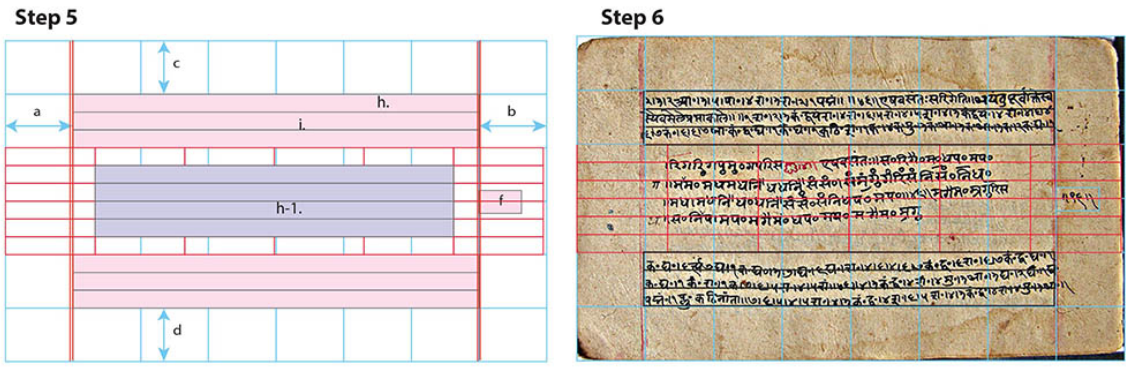


Figure 4.38: Digital Illustration - A Page Layout Template Design for a Manuscript with '*Tripatha*' style

4.2.3 (b1) - Type 4: Grid Construction of a Manuscript with a Portrait Layout Format

Type 3: Manuscript with Portrait Layout Format
Manuscript Title: *'Shree Samarthakruta Yuddhakanda Prat'*, 17th Century
Library Details: Samartha Vagdevata Mandir, Acc. No. Bad No. 255
Physical Description
Orientation: Portrait Layout Format
Size of Manuscript: Width 110 mm x Height 175 mm
Genre: Epic - Ramayana (Poetry)

A representative manuscript selected for the observation is a poetry form of literature. It has rhythmic and aesthetic qualities, written in Indian rhetoric system. One of the distinct design features of this layout is '*hasia*' borders, which are eliminated from the layout design. *Hasia* borders are the prominent element of most of the manuscripts of the seventeenth century Devanagari Brahmanical manuscripts. Another unique design feature is; the verses are written in the stanza format, and each stanza comprises of four lines and forty-eight syllables. Each line has twelve syllables. Every stanza is numbered and these numbers are written below the last line. (Figure 4.39)

Following digital illustrations represent critical investigation of grid formation process of '*Shree Samarthakruta Yuddhakanda Prat*' manuscript to design a template page. (Figure 4.39 - Figure 4.40)

Step 1: Selection of paper with a specific size for manuscript writing.

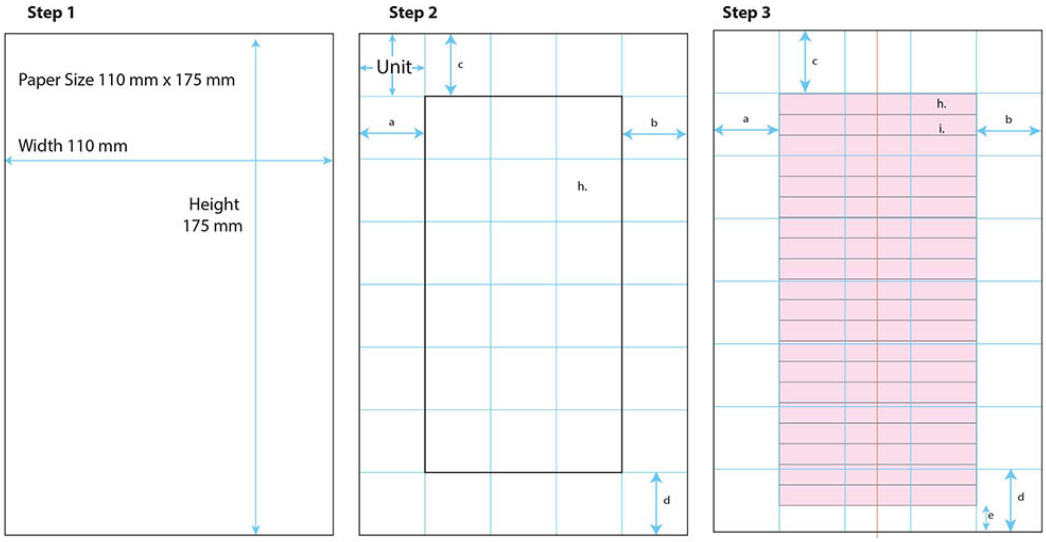


Figure 4.39: Digital Illustration - A Grid Construction of a Manuscript with a Portrait Format Page Layout - Poetry Form

Step 2: The horizontal space is divided into five columns of equal width. The vertical space is divided into eight rows of equal height. This division has guided in the defining area for text block and margin within the page layout. This procedure has created an intersection of columns and rows resulted in the formation of a modular grid consisting of a number of units. One unit area from all sides has been utilized as a margin area i.e. left, right, top and bottom respective. This process has also defined a text block area 'h' (Figure 4.39 - Step 2)

Step 3: Text block i.e. 'h' area, as shown in Figure 4.39 - Step 3 is divided into eighteen horizontal rows. Two extra rows are added at the bottom beyond the text block area.

Step 4: Three stanzas are planned per page. As per the rhetoric style chosen for poetic writing form, each stanza is a group of four lines. Between each stanza, three horizontal rows are left blank. Thus, eighteen lines within a text block area are occupied. Further, to write a stanza number shown as 'f' in Figure 4.40- Step 4, a place decided i.e. in the horizontal center and in the vertical center of line number five and six; twelve and thirteen; and nineteen and twenty. Line numbers nineteen and twenty, which are outside text block and in the margin area are utilized to write stanza number of the bottommost stanza. Thus, a template of page layout is created.

Step 5: Using the template created earlier, completed the writing on a page.

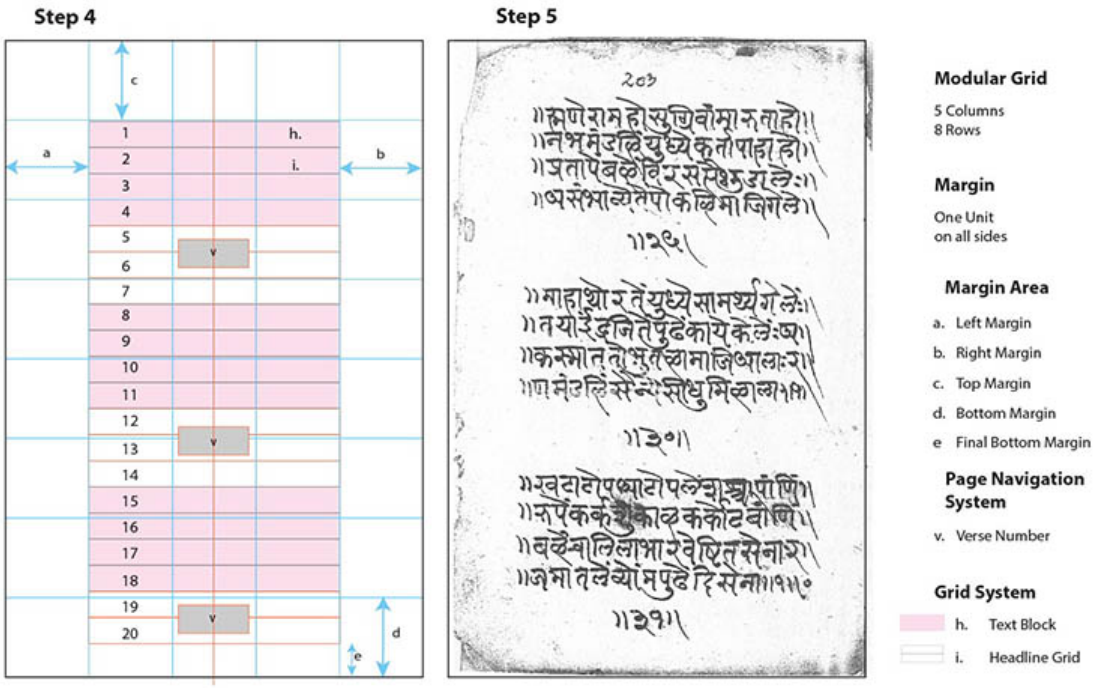


Figure 4.40: Digital Illustration - A Page Layout Template Design of Portrait Format Manuscript (Poetry Form)

Type 4: Manuscript with Headline Grid
Manuscript Title: *'Kalyanpotha*, written by Kalyanswami, 17th Century
Library Details: Samartha Vagdevata Mandir, Acc. No. Bad No. 51
Physical Description
Orientation: Portrait Layout Format
Size of Manuscript: Width 210 mm x Height 240 mm
Genre: Epic - Ramayana

A representative manuscript is selected for the observation noticed dissimilar design features from the seventeenth century Devanagari Brahmanical manuscripts. One of the distinct design features of this layout is '*hasia'* borders which are eliminated from the layout design. Another unique design feature noticed that verses are written in the stanza format and each stanza comprises of two lines. Every stanza is numbered and these numbers are written below it. (Figure 4.42)

Step 1: Selection of paper with a specific size for manuscript writing.

Step 2: The vertical space is divided into thirty-eight rows of equal height to create a headline grid.(Figure 4.41)

Step 3: This division has guided in defining text block and margin area within the page layout. The top and the bottom margins are marked by using two horizontal blocks. The horizontal margin is also defined. i.e. left, right, respective. Defined a text block area is denoted by 'h' (Figure 4.41 - Step 2 & 3)

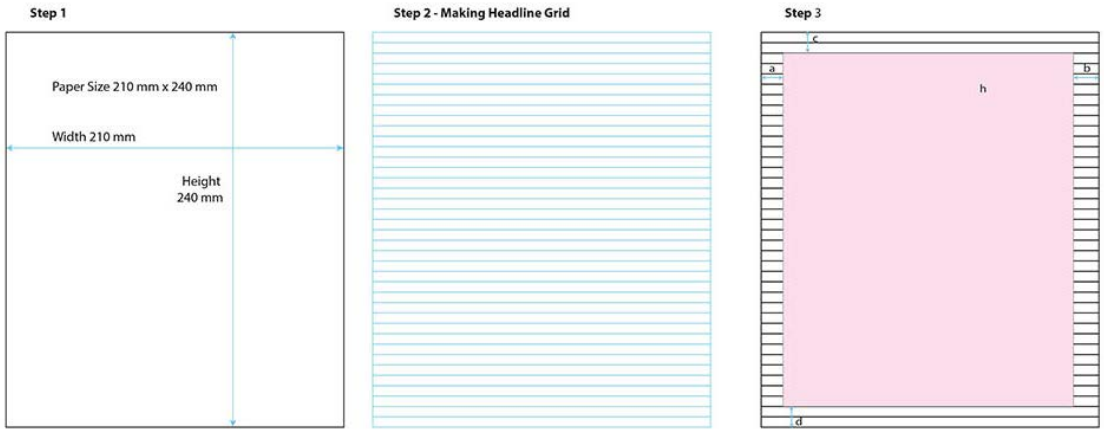


Figure 4.41: Digital Illustration of Grid Construction of a Manuscript with a Portrait Format Page Layout with Horizontal Ruling (Step 1-3)

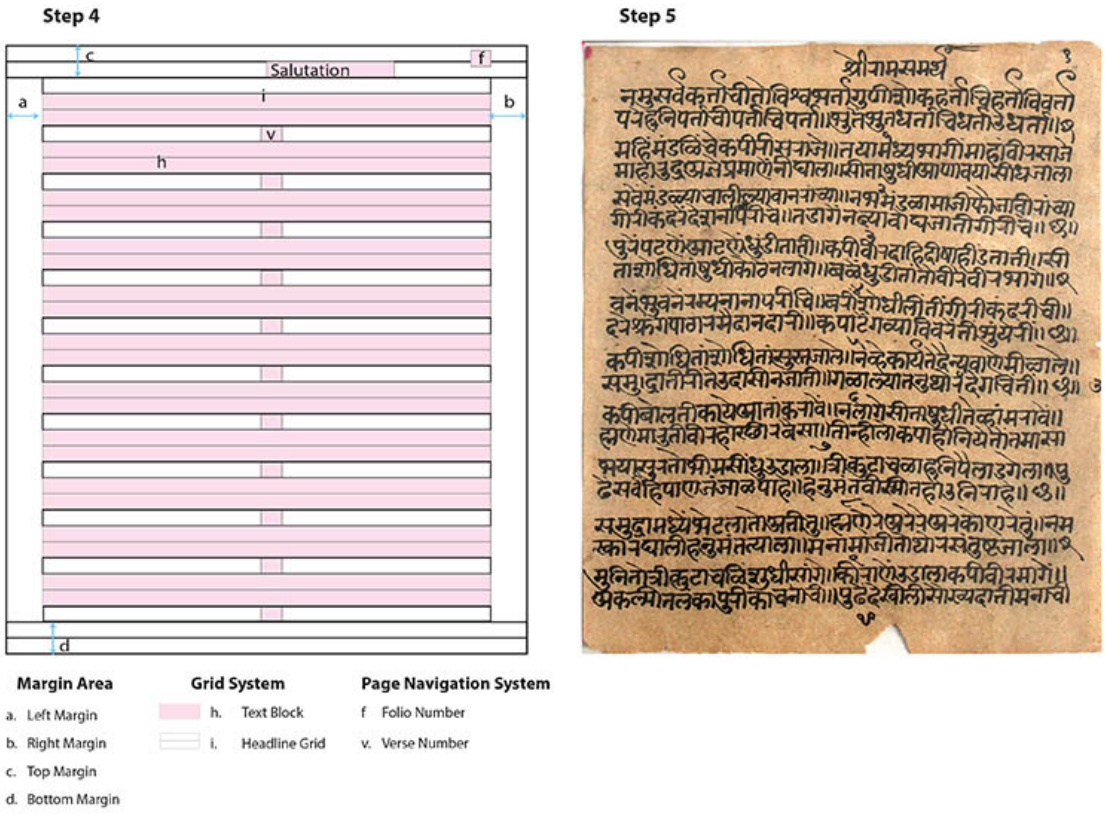


Figure 4.42: Digital Illustration of Grid Construction and Template Design of a Manuscript with a Portrait Format Page Layout with Horizontal Ruling (Step 4-5)

Step 4: Eleven stanzas are planned per page. As per the rhetoric style was chosen for poetic writing form, each stanza is a group of two lines. Between each stanza, one horizontal rows are left blank. Further, to write a stanza number shown as ‘v’ in Figure 4.42- Step 4, a place decided i.e. in the horizontal center of the blank row. Thus, a template of page layout is created. The salutation of god is written in the top second row and the folio number is denoted by ‘f’ in Figure 4.42 - Step 4, is written in the first row and aligned to the right edge of the text block. Thus, a template of page layout is created.

Step 5: Using the template created earlier, completed the writing on a page

4.2.3 (b2): Grid Construction Patterns in the Modern Books or Publication Designs

Representative books from various genres were selected to understand the grid structure, margin area and position of the text block in the page layout. The entire process of understanding grid and structure of manuscript has been explored through 'Digital Visual Representation Method'.

Criteria for representative modern books selection are as follow:

1. Modern Book with a single column page layout format
2. Modern Book with multiple columns page layout format

Table 4. 5: Details of Representative Modern Books for Layout Grid Study

Sr. No.	Page Layout Grid Type	Book Size W x H in mm	Grid - Columns & Rows	Type of Publication	Book Title
1	Single Column Modular Portrait Format	138 x 210	9 x 13 Modular Grid	Historical Narrative Biography	*Lokapala Raja Sayajirao* Saket Prakashan, 2013
2	Single Column Landscape Format	138 x 240	1 x 1	Narrative Biography - Holy Book	*Shree Gajanan Vijay* Shri Shivshankar Patil, 2009
3	Multicolumn Portrait Format	190 x 257	12 x 3	Weekly Family Magazine	*Sakal Saptahika* Sakal Publishers Pvt. Ltd., 2016
4	Multicolumn Modular Grid	190 x 257	3 x 4	Weekly Family Magazine	*Sakal Saptahika* Sakal Publishers Pvt. Ltd., 2016
5	Multicolumn Grid	190 x 257	3 x 1	Weekly Family Magazine	*Sakal Saptahika* Sakal Publishers Pvt. Ltd., 2016
6	Multicolumn Symmetrical Grid	190 x 257	2 x 1	Weekly Newsletter	Family Doctor, Sakal Publishers Pvt. Ltd., 2016
7	Multicolumn Asymmetrical Grid	190 x 257	2 x 3	Weekly Family Magazine	*Sakal Saptahika* Sakal Publishers Pvt. Ltd., 2016
8	Mix Grid Layout	127 x 185	2-3 x 3	Book - Travel Guide	Lonely Planet
9	Hierarchical Grid	180 x 250	1 x 2	Book - Holy Book	Dasbodh
10	Golden Section	18 in x 9 in	3 x 3	Catalogue	Unpublished Work

4.2.3 (b2) Type 1: A Single Column Portrait Format, Modern Publication Design

A representative modern book, a biography of historical narrative genre is selected for the study. A page layout consists of single column and portrait format. Following digital illustrations represent critical investigation of grid formation process of *'Lokapala Raja Sayajirao'* to design a template page. (Figure 4.43)

Step 1: Define a print area for the document, which is a trimmed book size.

Step 2: The vertical document space is divided into thirteen rows of equal height and horizontal space is divided into nine columns. This procedure has created an intersection of columns and rows, resulted in formation of a modular grid consisting of units. One unit area from all sides is utilized as a margin area i.e. left, right, top and bottom respectively. This process has also defined a text block area 'h' (Figure 4.43 - Step 2)

Step 3: Further, the text block area (h) is divided vertically with parallel lines for creating headline grid to compose body text on it. Page number (f) and running title (e) are aligned to the top edge of bottom margin unit. (Figure 4.43 - Step 3)

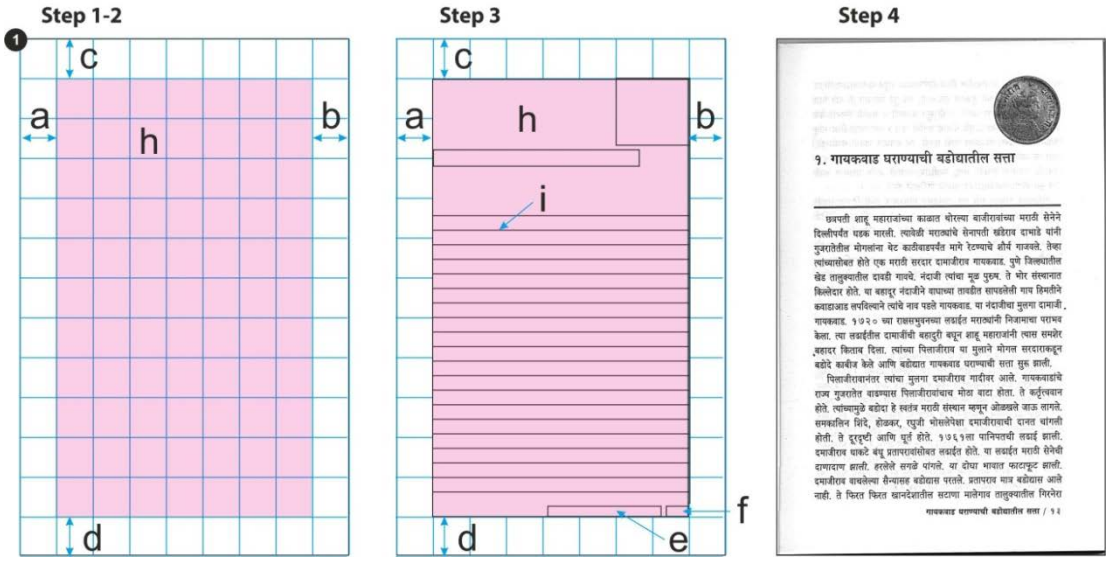


Figure 4.43: A Single Column Page Layout with Portrai Format - Digital Illustration of Deconstruction (Type 1: Step 1-3), Modern Publication Design

4.2.3 (b2) Type 2: A Single Column Landscape Format, Modern Publication Design

A representative modern book is selected for the observation of a religious narrative biography. A page layout consists of single column and landscape format. Following

digital illustrations represent critical investigation of grid formation process of *'Shri Gajanana Vijaya'* to design a template page. (Figure 4.44)

Step 1: Define a print area for the document, which is a trimmed book size. Margin area defined. The left and the right margin sizes are bigger than the top and the bottom margins.

Step 2: Text block area is further divided into fifteen parallel lines i.e. headline grid. (Figure 4.44 - Step 2)

Step 3: The left margin is utilized for placing running title (e), and the right margin area is utilized for placing page number (f), and section title. *Hasia* borders as seen in handwritten manuscripts are replaced by decorative borders at the edge of left and right margin.

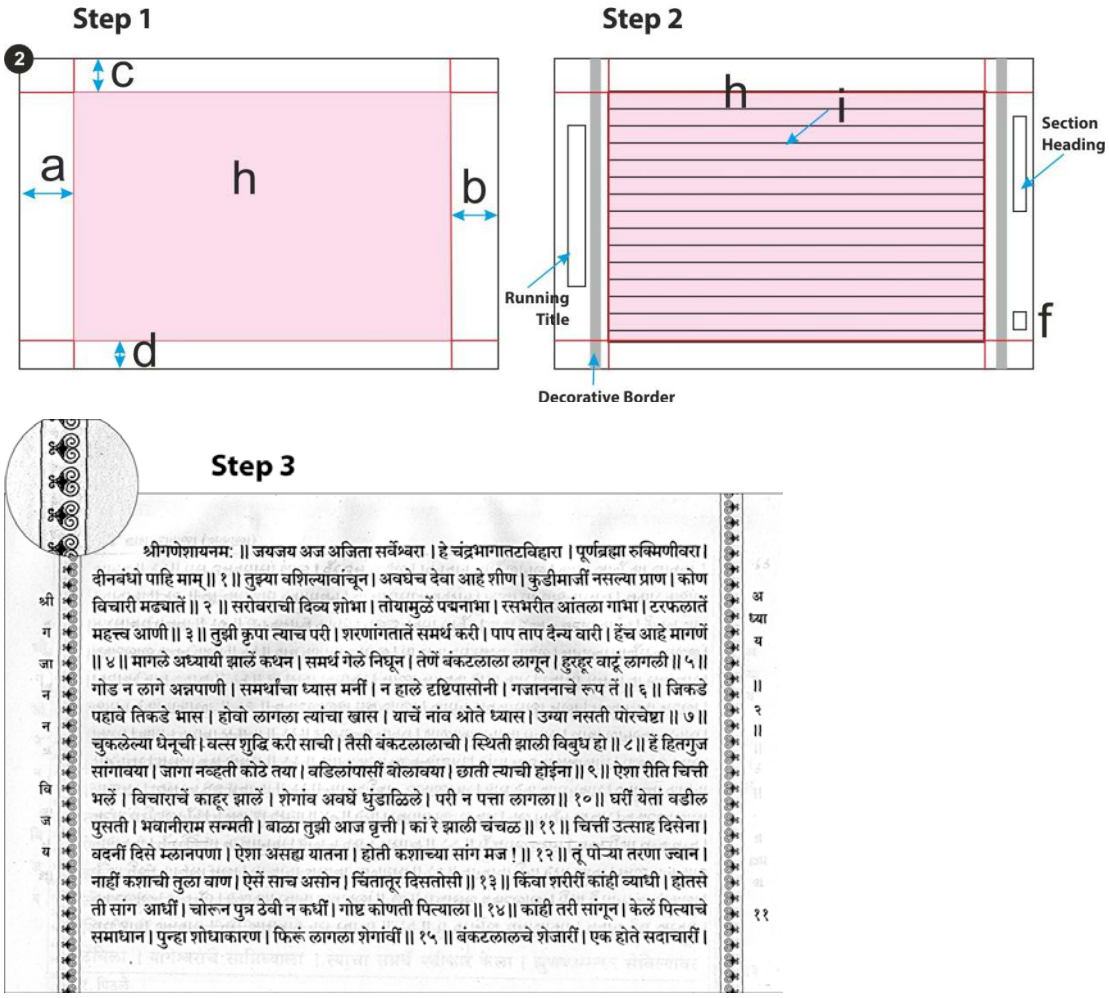


Figure 4.44: Single Column Page Layout with Landscape Format - Digital Illustration of Deconstruction (Type 2: Step 1-3), Modern Publication Design

4.2.3 (b2) Type 3: A Multicolumn Portrait Format, Modern Publication Design

A representative modern book selected for the observation is a weekly family magazine. A page layout consists of a multiple column and portrait format. The following digital illustrations represent critical investigation of grid formation process of *'Sakal Saptahik'* to design a template page. (Figure 4.47)

Step 1: Define a print area for the document, which is a trimmed book size. (Figure 4.45 - Step 1)

Step 2: First margin areas have been defined. The top margin area is 28 mm. It is kept bigger in size for the purpose of header illustrations, running title, and section heading. In the bottom margin is (12 mm) mainly displayed the date of the issue and the page number. As per the requirement of the design, in few sections subject specific illustrations incorporated. The left and the right margin area are of equal size i.e. 15 mm. This process has created a text block space for placing content (h). This text block place is divided vertically into three rows of equal height and horizontally into twelve columns. This procedure created intersection of columns creating guidelines for placing content (Figure 4.45 - Step 2)

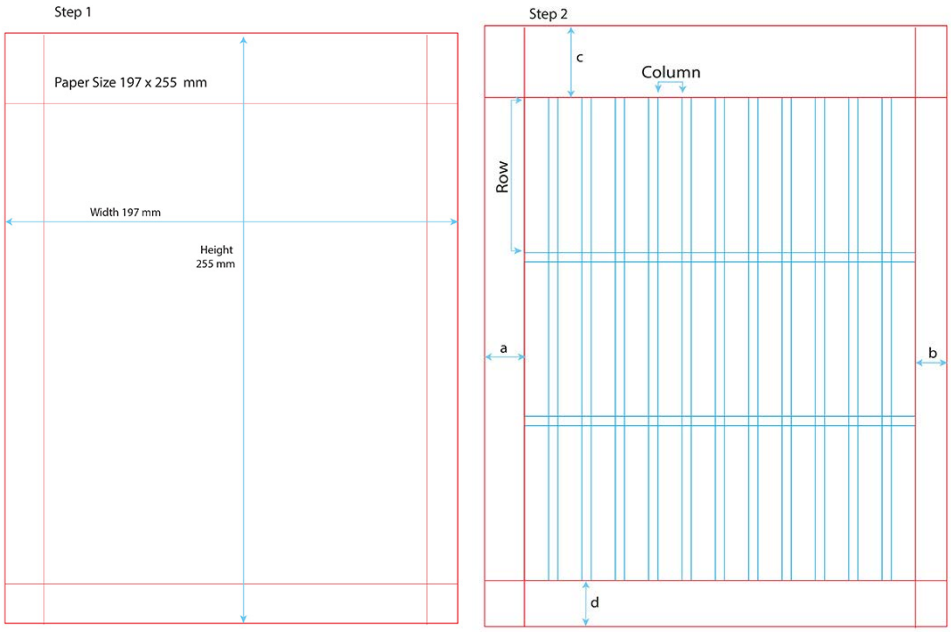


Figure 4.45: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3: Step 1-2), Modern Publication Design

Step 3: Illustration of the running title is placed in the top margin area and is aligned to the left edge of text block and the width is of two columns. The text block area (h) is divided vertically with parallel lines for creating headline grid to compose body text on

it. The combination of module areas and columns help to make the template of the page layout. Areas marked for the text and images of four different type of text (Figure 4.46 - Step 3)

Step 4: Template created earlier, which was utilized to place various types of paragraphs with distinctive styles, are placed in the text block area along with the images (Figure 4.46 - Step 4). Final layout is represented in Figure 4.47.

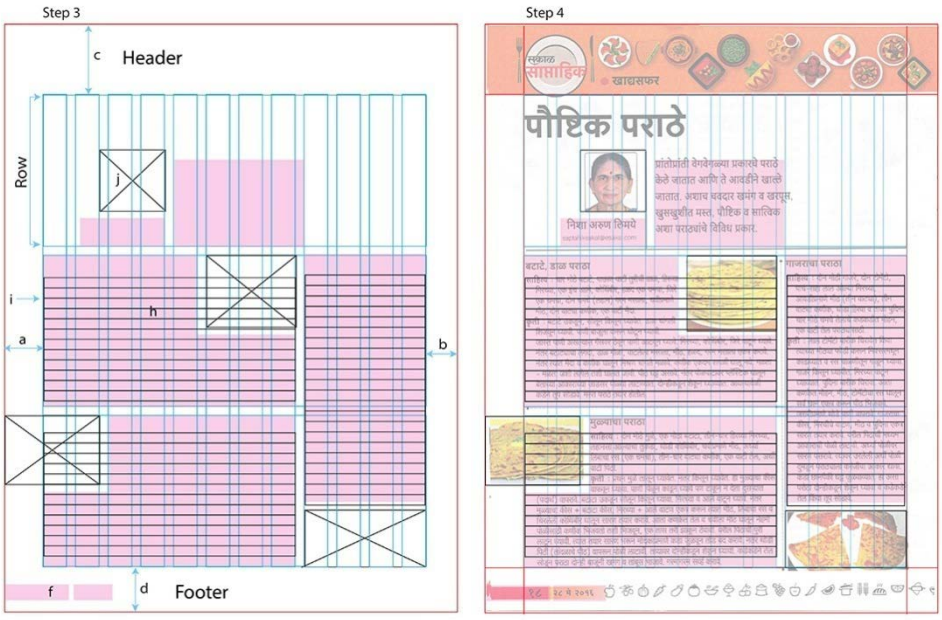


Figure 4.46: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3:Step 3-4), Modern Publication Design



Figure 4.47: Multiple Column Page Layout with Portrait Format - Digital Illustration of Deconstruction (Type 3), Final Layout, Modern Publication Design

4.2.3 (b2) Type 4: A Multicolumn Modular Grid, Modern Publication Design

Step 1: Define a print area for the document, which is a trimmed book size. (Figure 4.48 - Step 1). First margin areas have been defined.

Step 2: Areas planned for the text block, running title, section title, page number, volume number. Text block area (h) is divided into three columns. (Figure 4.48 - Step 2)

Step 3: Text block area divided horizontally into four modules. This process has created twelve units to place the content of twelve moon signs. (Figure 4.48 - Step 3)

Step 4: Each module is futher divided into baseline grid. Each module has line count 9 as per the chosen font size (Figure 4.48 - Step 4). Thus a template is ready to place content.

Step 5: Content is placed on the pages to complete the design job. (Figure 4.48 - Step 5)

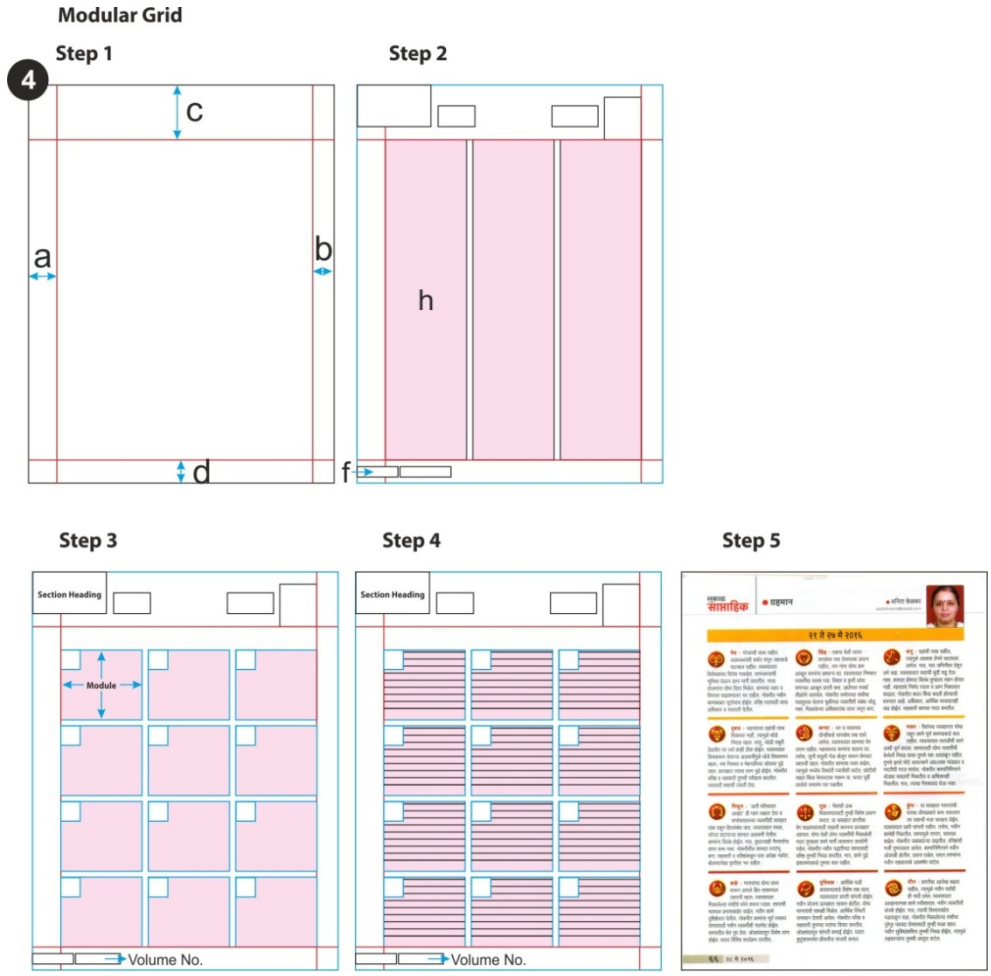


Figure 4.48: Multiple Column Modular Grid Page Layout - Digital Illustration of Deconstruction (Type 4:Step 1-5), Modern Publication Design

4.2.3 (b2) Type 5: A Multicolumn Grid Page Layout, Modern Publication Design

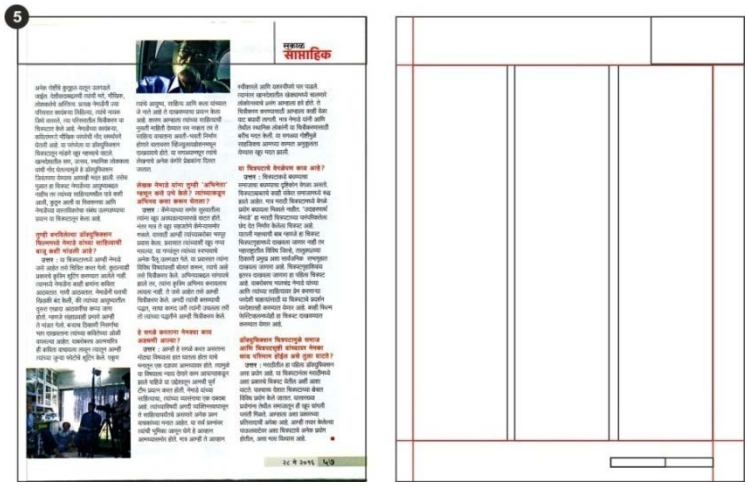


Figure 4.49: Multiple Column Grid Page Layout - Digital Illustration of Deconstruction (Type 5), Modern Publication Design

4.2.3 (b2) Type 6: A Multicolumn Symmetrical Grid, Modern Publication Design



Figure 4.50: Multiple Column Symmetrical Grid Page Layout - Digital Illustration of Deconstruction (Type 6, Modern Publication Design

4.2.3 (b2) Type 7: Multicolumn Asymmetrical Grid, Modern Publication Design



Figure 4.51: Multiple Column Asymmetrical Grid Page Layout - Digital Illustration of Deconstruction (Type 7), Modern Publication Design

4.2.3 (b2) Type 8: Mix Grid Layout, Modern Publication Design

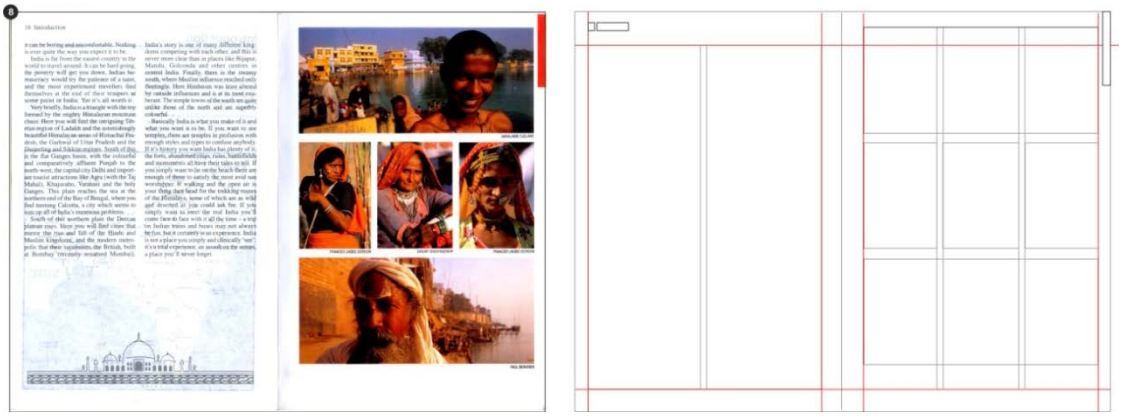


Figure 4.52: A Mix Grid Page Layout - Digital Illustration of Deconstruction (Type 8), Modern Publication Design

4.2.3 (b2) Type 9: Hierarchical Grid, Modern Publication Design

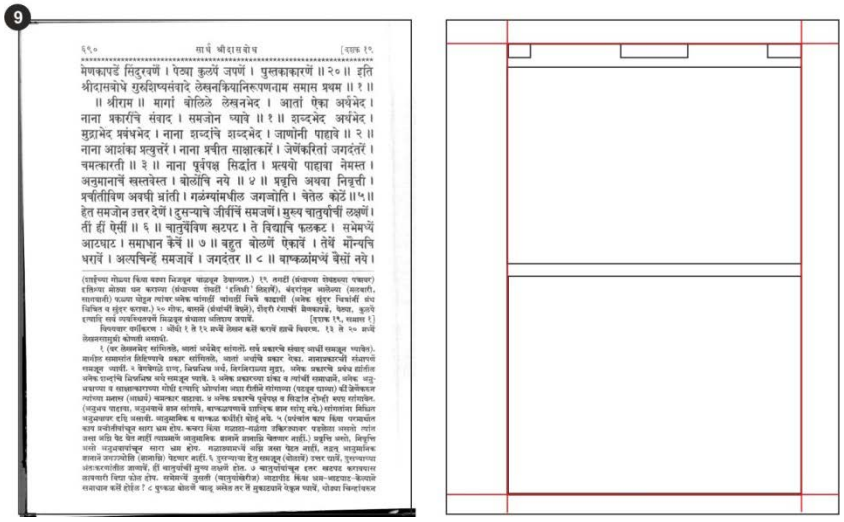


Figure 4.53: A Grid Construction of a Hierarchical Grid Page Layout - Digital Illustration of Deconstruction (Type 9), Modern Publication Design

4.2.3 (b2) Type 10: Golden Ratio Grid, Modern Publication Design

Step 1: Use a template or create a Golden Ratio Grid

Step 2: Decided Image area

Step 3: Images placed in the area

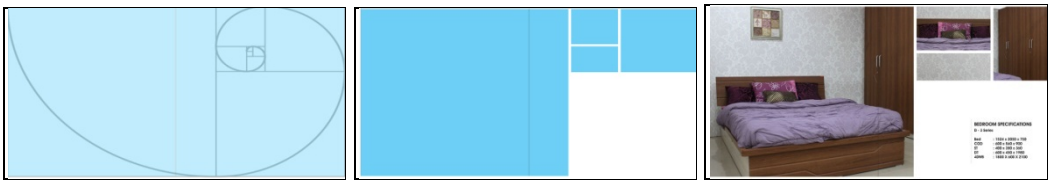


Figure 4.54: A Grid Construction of a Golden Ratio Grid Page Layout - Digital Illustration of Deconstruction (Type 10), Modern Publication Design

4.2.3 (c) Type Styles and Paragraph Alignments

Every page layout has textual information and a mixture of information categories, e.g. heading, subheading, body copy, photo captions, etc. Different typefaces are chosen to represent the category. These typefaces comprise various styles such as handwritten, calligraphic, humanist, with decorated serifs, with thick and thin strokes, etc. In modern graphic design, most of the fonts have font families with attributes such as regular, bold, italics, bold italics, extra bold etc. Paragraph lines within text blocks are aligned to each other in a specific manner.

Approach to Study Type Style and Paragraph Alignments of Devanagari Brahmanical Manuscripts and Modern Books

Representative seventeenth century Devanagari Brahmanical manuscripts from various repositories of Maharashtra are selected to understand basic typographic palette and compared the observations with the modern publication design.

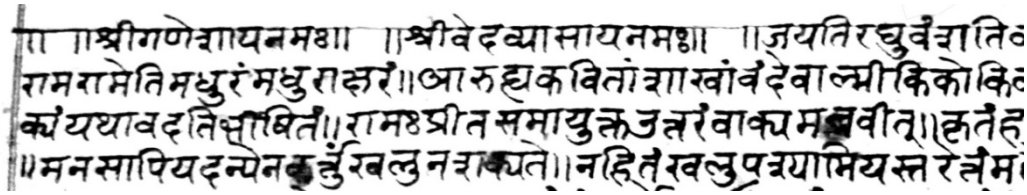
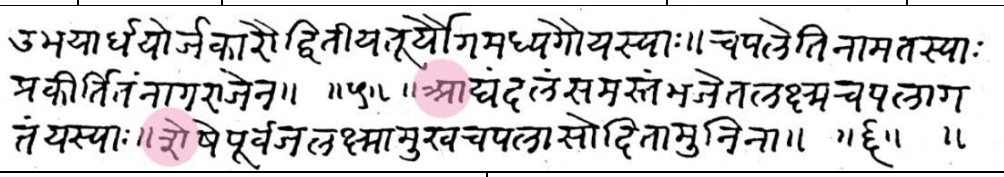
Representative manuscripts selected from Deccan College Post Graduate and Research Institute (6), Anandashram Sanstha (1), Samartha Vagdevata Mandir (3) and Bharat Itihas Samshodhak Mandal (3). Common features observed related to the basic typographic palette which includes type styles and paragraph alignments documented in a visual method.

Modern books with various layouts such as cover pages and inside pages are observed to understand the selection of basic typographic palette which includes type size as per the level of importance and paragraph alignments. Modern books of various genres with different layouts are selected for the study. The observations are documented in a visual method.

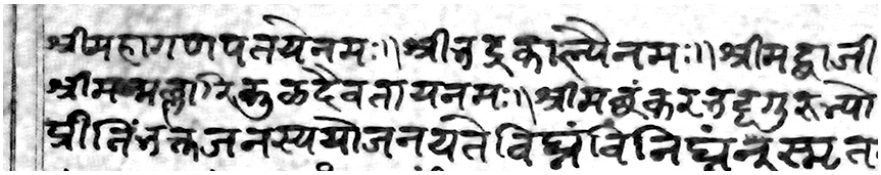
4.2.3 (c) a1: Type Styles of the Representative Seventeenth Century Representative Devanagari Brahmanical Manuscripts

Observations about typestyle, line spacing, characters per line, lines per page, alignment of text recorded in Table 4.6 along with manuscripts images.

Table 4.6: Type Styles of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

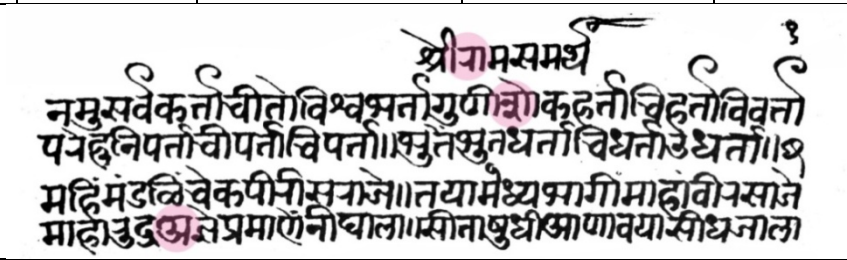
Sr. No.	Library	Manuscript Title	Accession No.	Period
1	SVM	*Samarthakruta Ramayana*	746	1623 AD
				
Style: Handwritten text Grey Value: Medium Form of text - Legible, Readable		Letters per Line: Lines Per Page: 15-17		
2	DC	*Vrutta - Ratnakarah (Satikah)*	3001	1637 AD
				
Style: Handwritten text Old Classic type letterforms - a, ra, sha Grey Value: Light Form of text - Legible, Readable		Letters per Line: 35-44 Lines Per Page: 11-13		
3	DC	*Patanjali Mahabhasya*	817	1653 AD
				
Style: Calligraphic text Old Classic type letterforms - a, sha Grey Value: Dark (Bold) Form of text - Legible, Readable		Letters per Line: 55-58 Lines Per Page: 14 **Special Remarks** - Fluid, Cursive terminals and vowel symbols		

Sr. No.	Library	Manuscript Title	Accession No.	Period
4	DC	*Patee Ganita*	97	1661 AD



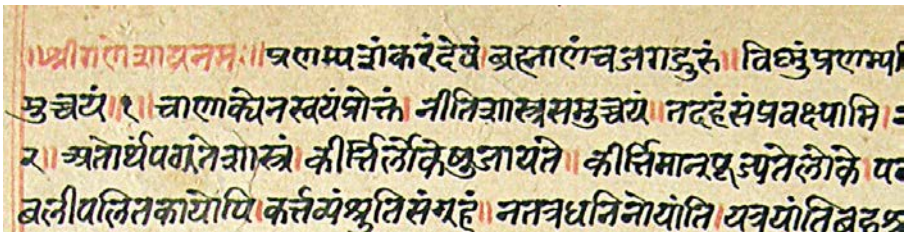
Style: Handwritten text, daily writing Grey Value: Dark (Bold) Form of text - Legible, Readable	Letters per Line: 38 Lines Per Page: 20 **Special Remarks** - Inconsistent form of lettering

5	SVM	*Kalyanpotha*	158	Late 17th Century



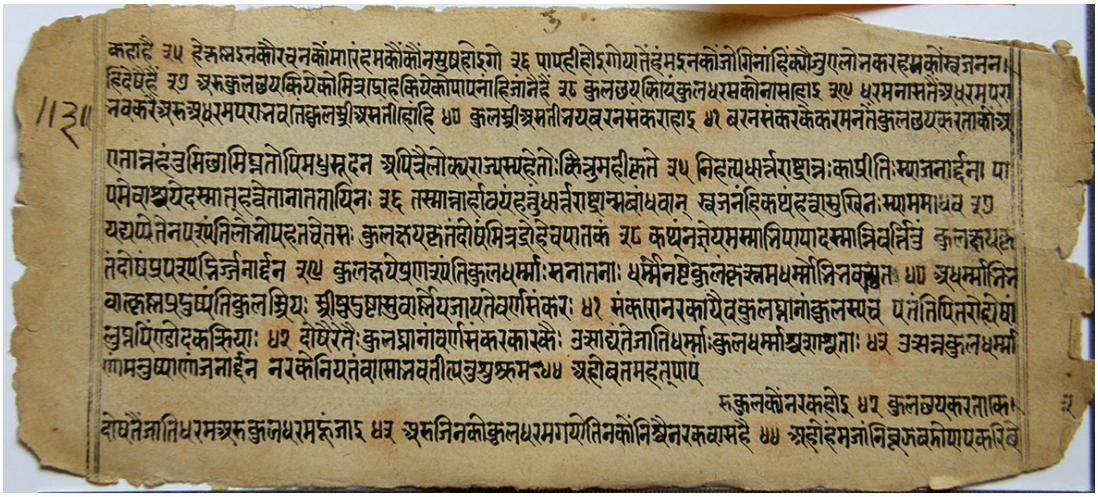
Style: Calligraphic text Old Classic type letterforms - a, sha Grey Value: Dark (Bold) Form of text - Legible, Readable	Letters per Line: 24 Lines Per Page: 14 **Special Remarks** - Fluid and cursive vowel symbols, paragraph space Metrical literature

6	Anandashram	*Vruddhachanakya*	S 10-2-12	1694 AD



Style: Calligraphic text Grey Value: Dark (Bold) Form of text - Legible, Readable	Letters per Line: 31-36 Lines Per Page: 14 **Special Remarks** - Fluid, cursive terminals, and vowel symbols beautiful consistent lettering Written aesthetically **Metrical literature** - Four verses of eight syllables in one stanza Coloured punctuation Marks

Sr. No.	Library	Manuscript Title	Accession No.	Period
7	BISM	*Bhagvad Geeta - Satikah*	51/73	1696 AD



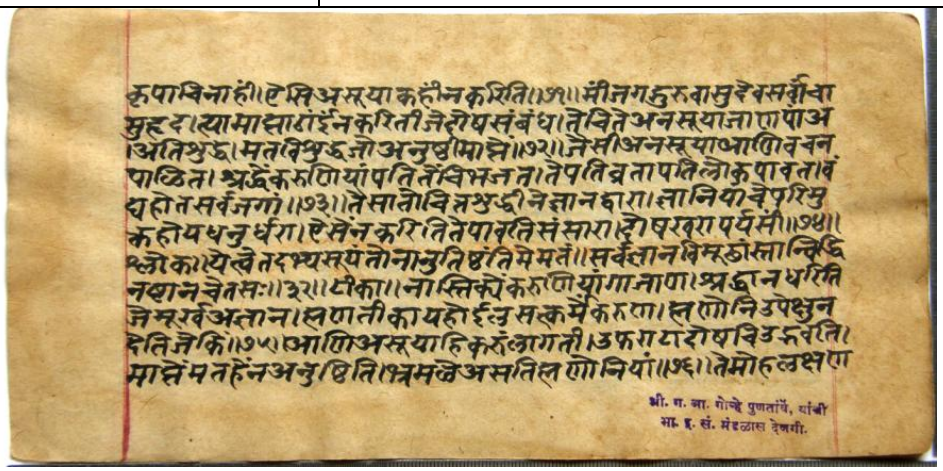
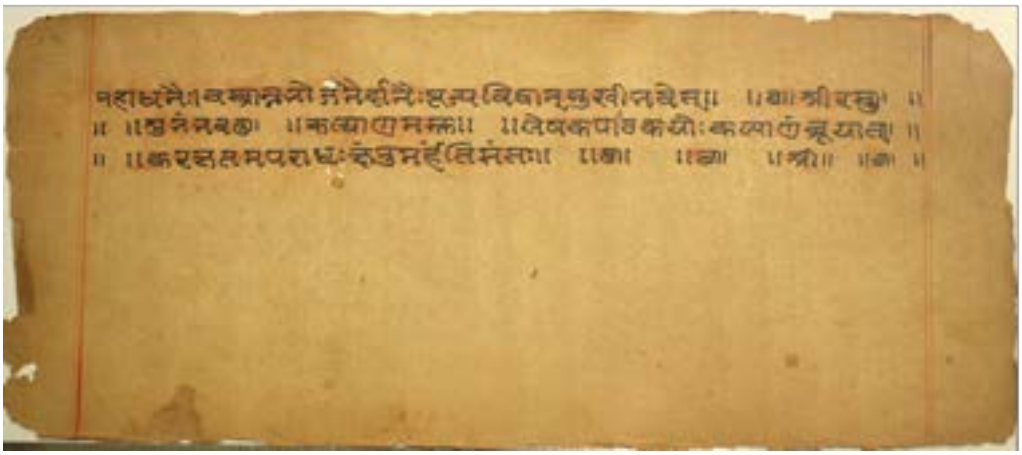
Style: Calligraphic text Grey Value: Dark (Bold) Form of text - Legible, Readable	**Letters per Line:** For main text - approx 48 Commentary - approx 58 Lines Per Page: 12 **Special Remarks** - • Fluid, Cursive terminals and vowel symbols • Variations in text size • Main text is larger than the commentary

4.2.3 (c) a2: Text Alignments in the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

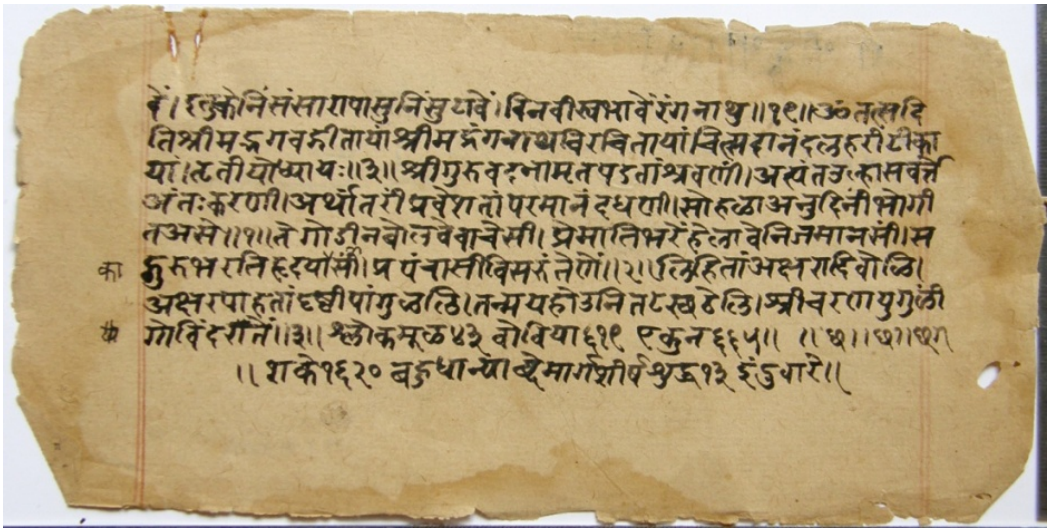
Representative manuscripts studied to understand various text alignments.

Details of representative manuscript with paragraph alignments presented in table form are as below:

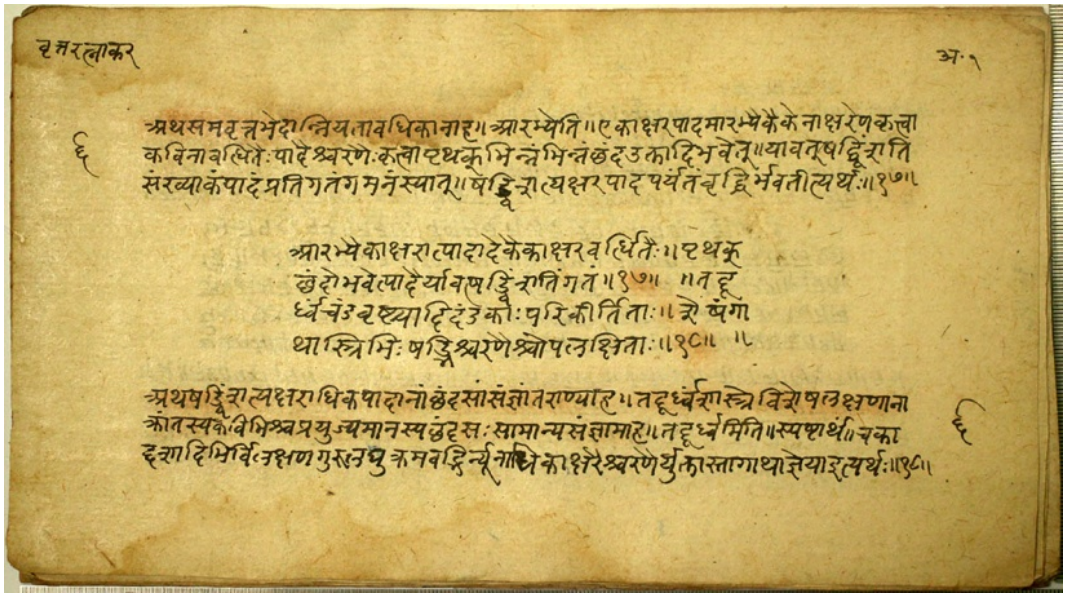
Table 4.7: Specimens of Text alignments of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

Type	**Manuscript Details**	*Bhagavadgeeta Tika*, BISM, Ac No. 39/125, 1698 AD
1	**Paragraph Alignment**	Justified - Text is aligned to the both ends of margins
		
Type	**Manuscript Details**	*Nirnaysindhu,* DC Ac.No. 850, 1653 AD
2	**Paragraph Alignment**	Justified - Text is aligned to the both ends of margins The last line of the text is effectively justified by adding specific symbols and characters to show end of the text
		

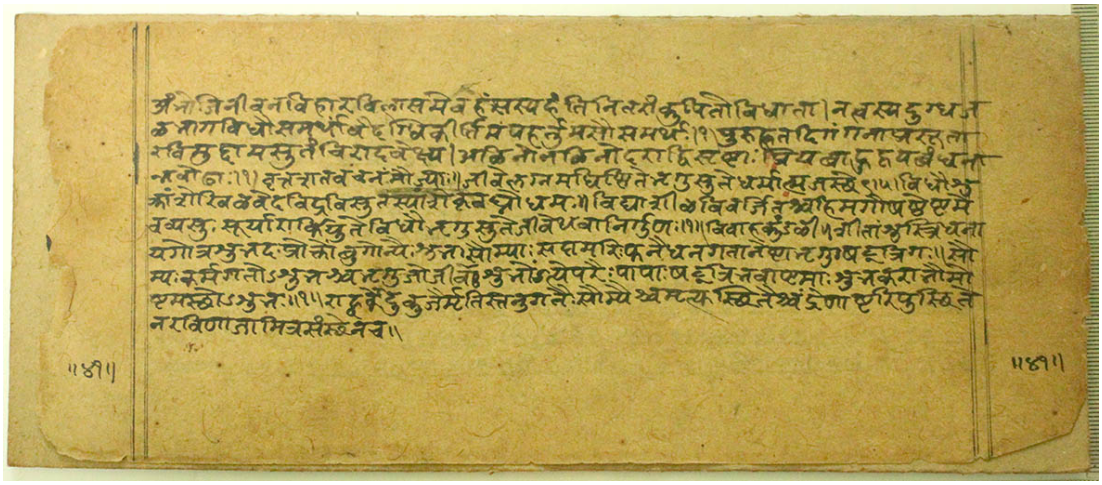
Type	Manuscript Details	*Ranganath Virachit 'Chitsadanadalahari' Tika*, BISM, Ac. No. 39125, 1620 AD
3	**Paragraph Alignment**	Justified - Text is aligned at both ends of margins The last line of the text is center aligned Second last line of the text is effectively justified by adding specific symbols and characters to show the end of the text as seen in Type 2.



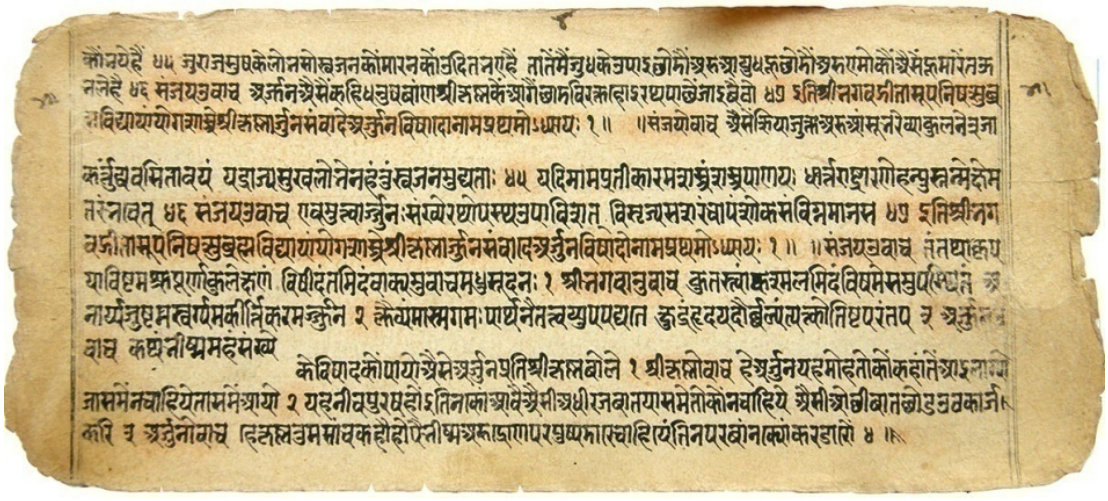
Type	Manuscript Details	*Vruttaratnakar*, DC, Ac No. 3001, 1637 AD
4	**Paragraph Alignment**	Justified - Text is aligned to the both ends of margins *Tripatha* style layout. Text block of the main text is placed in the vertical center of page, paragraph alignment of the text is justified



Type	Manuscript Details	*Patee Ganit*, DC, Ac. No. 97, 1661 AD
5	**Paragraph Alignment**	The last line of the text is left aligned



Type	Manuscript Details	*Bhagvad Geeta - Satikah*, BISM, Ac. No. 51/73, 1696 AD
6	**Paragraph Alignment**	Justified - Tripatha style page layout Indented last paragraph, Paragraph begins where the last line of previous paragraph ends (Drop line text alignment)



4.2.3 (c) b1: Type Styles of Representative Modern Publication Designs

Following are the examples of the representative modern publication designs with variety of typefaces and their styles applied for text in single page layout compositions.



Figure 4.55: Use of Multiple Typestyles in Single Page Layout Designs, (Type 1-6) Modern Publication design - (Narale, Sanskrit Primer), (Pangarkar, 1990), (Family Doctor, 2016), (*Saptahik Sakal*, 2016), Sakal Publishers Pvt. Ltd., 2016,

4.2.3 (c) b2: Text Alignments in Modern Publication Design

Following are the most commonly used text alignments in modern publication designs.

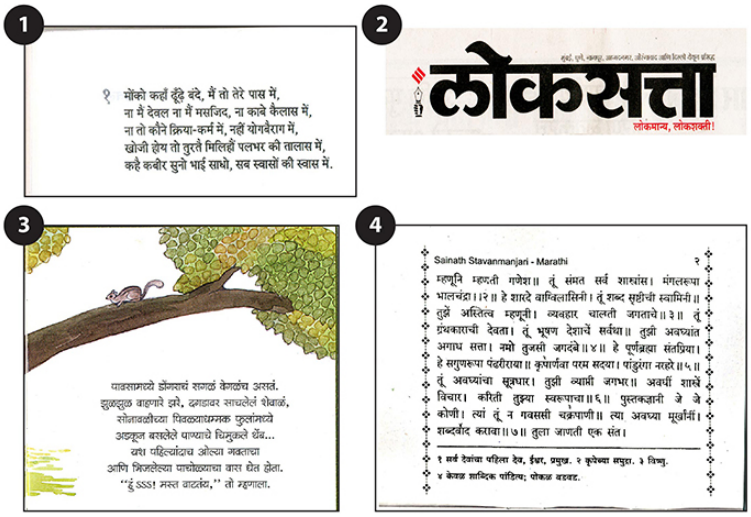


Figure 4.56: Basic Text Alignments in Modern Graphic Designs, (Type 1-4) Modern Publication design

Following are the examples of multiple types of paragraph alignments in single page layout

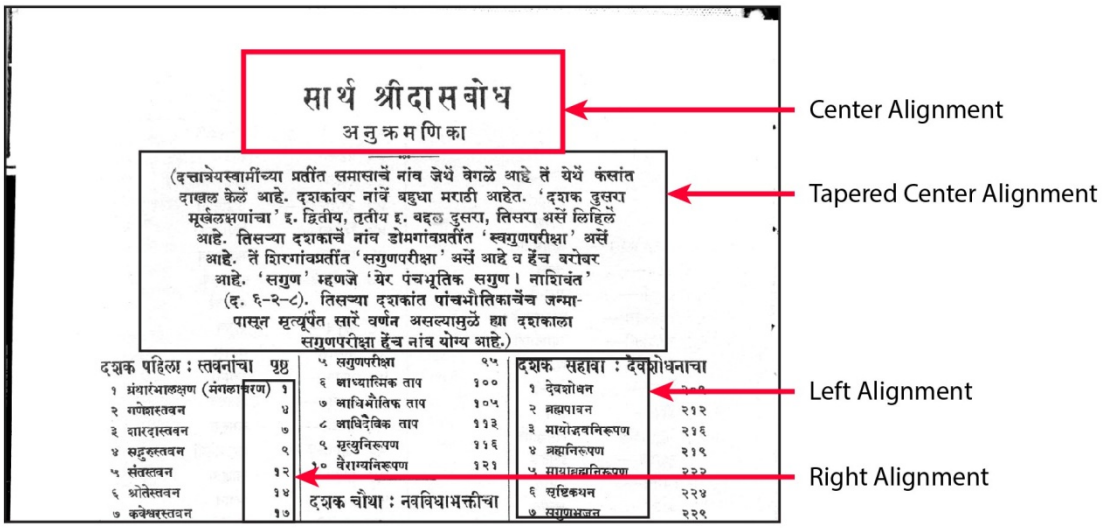


Figure 4.57: Combination of Multiple Text Alignments in Layout Composition, Modern Graphic Designs, (Pangarkar, 1990)

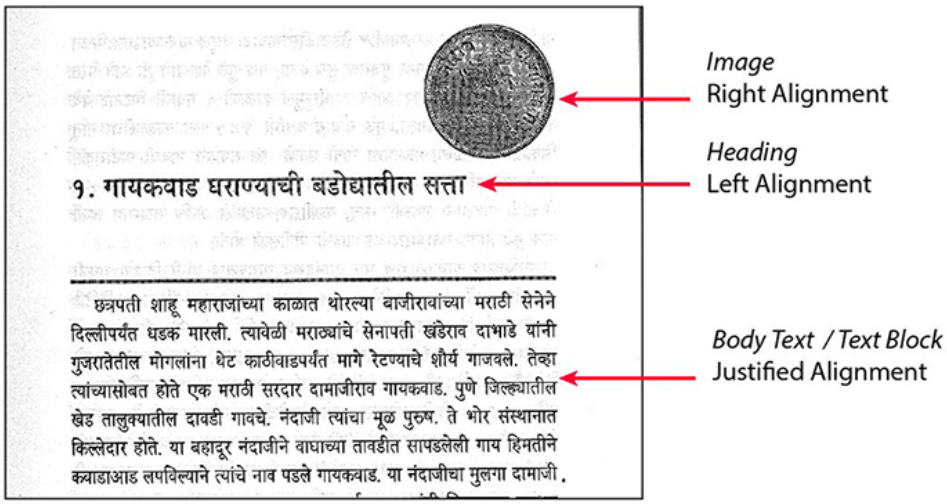


Figure 4.58: Combination of Multiple Text Alignments in Layout Composition, Modern Graphic Designs, (Lokapala Raja Sayajirao, 2013)

4.2.3 (d) Graphic Strategies

Supportive images, narrative illustrations and graphics along the side of the text help a reader in understanding the text-based information more effective. These visual contents provide ease in perusing the information more quickly rather reading a long text. Hence plays important role in page layouts.

Approach to Study Graphic Strategies in Devanagari Brahmanical Manuscripts and Modern Books

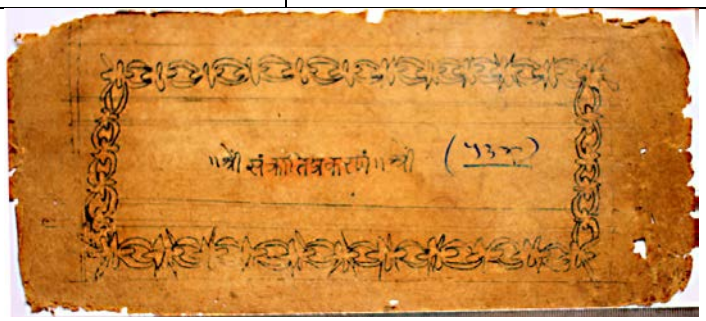
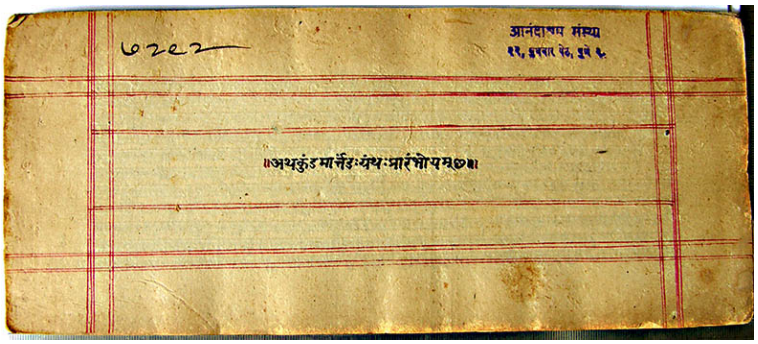
Representative seventeenth century Devanagari Brahmanical manuscripts from various repositories of Maharashtra are selected to understand graphic strategies and their placements in page layouts and compared observations with the modern publication design.

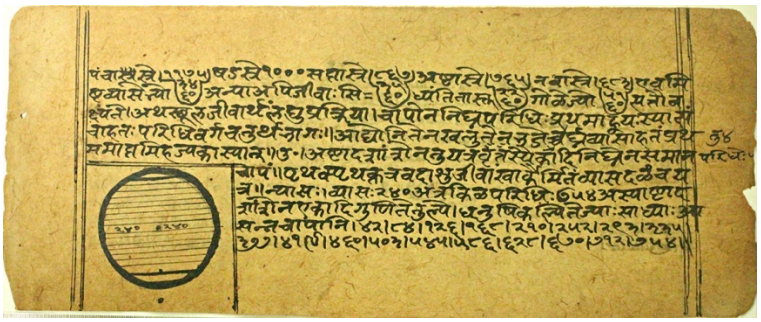
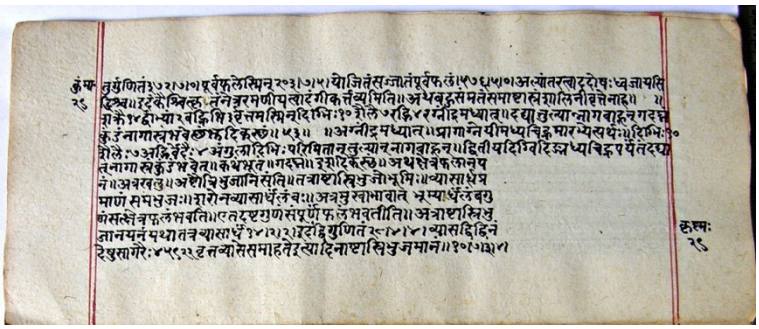
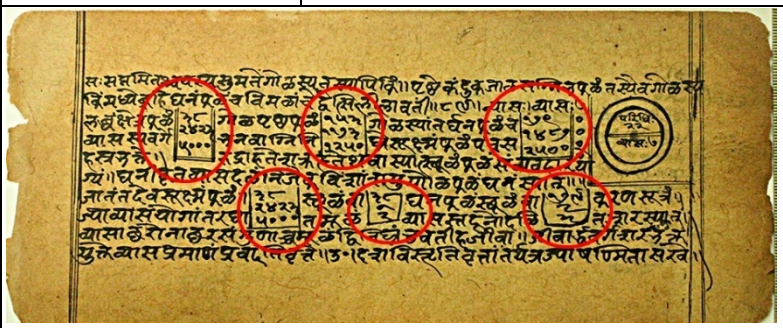
4.2.3 (d) a1: Graphic Strategies in Seventeenth Century Representative Devanagari Brahmanical Manuscripts

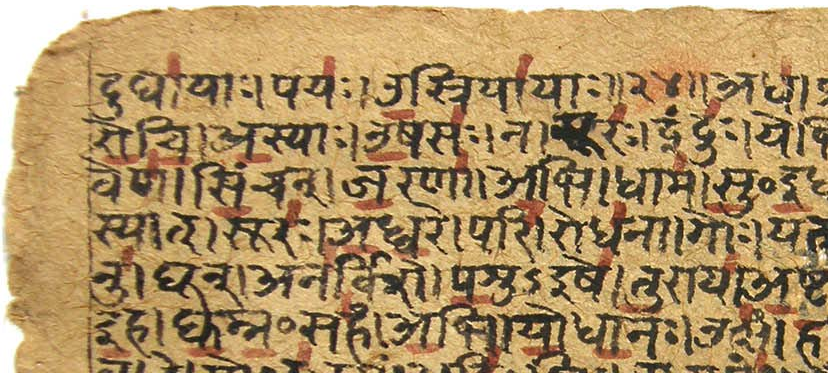
Representative manuscripts are selected from Deccan College Post Graduate and Research Institute (3), Anandashram Sanstha (2), Samartha Vagdevata Mandir (2), Bhandarkar Oriental Research Institute (1), and Bharat Itihas Samshodhak Mandal (2). The common features are observed in order to learn patterns in the use of illustrations. Observations documented in a visual method.

Following are the representative examples of the seventeenth century Devanagari Brahmanical manuscripts with the composition of illustrations and text together in page layouts.

Table 4.8: Seventeenth Century Devanagari Brahmanical Manuscripts - Page Layout Compositions with Illustrations and Text

Type	**Manuscript Details**	*Sankrantiprakarnam*, BISM, Ac. No. 52/524, 1699 AD	
1-i)			Cover Page - Floral border around title of manuscript
	Manuscript Details:	*Kundamartanda - Suprabha Vyakhya,* Anandashram, Ac. No. S 21-1-18, 1688 AD	
1-ii)			Cover Page - Geometric border around title of manuscript
2.	**Manuscript Details**	*Shree Samarthakrut Valmiki Ramayana* , SVM, Ac. No. Bad No., 1622 AD	
			Section separator with full page illustration and section title

3.	**Manuscript Details**	*Patee Ganita*, DC, Ac. No. 97, 1661 AD	
			Text wrapped around illustration in square form
4.	**Manuscript Details**	*Kundamartanda*, Anandashram, Ac. No. S 21-1-18, 1688 AD	
			Blank space for topic relevant illustration Evidence of text written first and illustrations are drawn later
5.	**Manuscript Details**	*Patee Ganita*, DC, Ac. No. 97, 1661 AD	
			Mathematical Tables are placed in line with the text
6.	**Manuscript Details**	*Bhagavata Purana*, BORI, Ac. No. 61/1907-15, 1648 AD	
			Narrative big size of illustration Two colours painted border around illustration Illustration extends beyond left margin lines

7.	**Manuscript Details**	*Devimahatmya*, DC, Ac. No. 10325, 1672 AD	
			Defined space for Narrative illustration by margins on all four sides Artist has taken a liberty by extending illustration beyond margin area
8.	**Manuscript Details**	*Kalyanpotha*, SVM, Ac. No. Bad No. 51, 17th Century AD	
			Full Page illustration with no limitations of the margin area
9.	**Manuscript Details**	*Rigveda Samhita*, BISM, Ac. No34/568, 1681 AD	
			**Typographic Graphics** - Accent Marks - Use of elements of design, e.g. horizontal and vertical lines

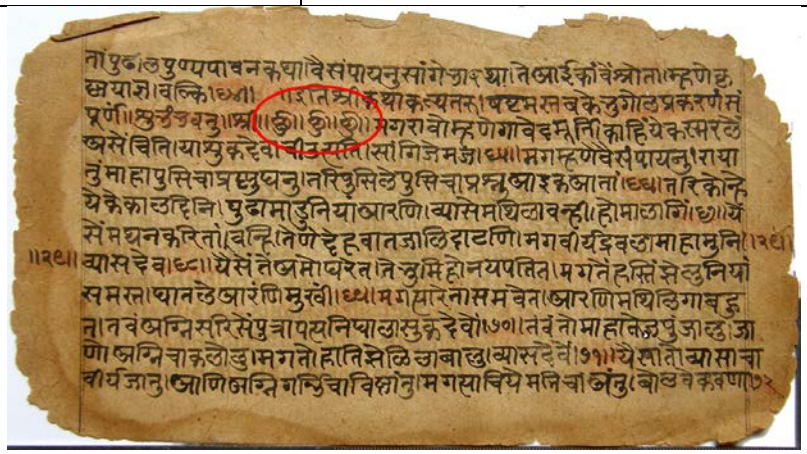
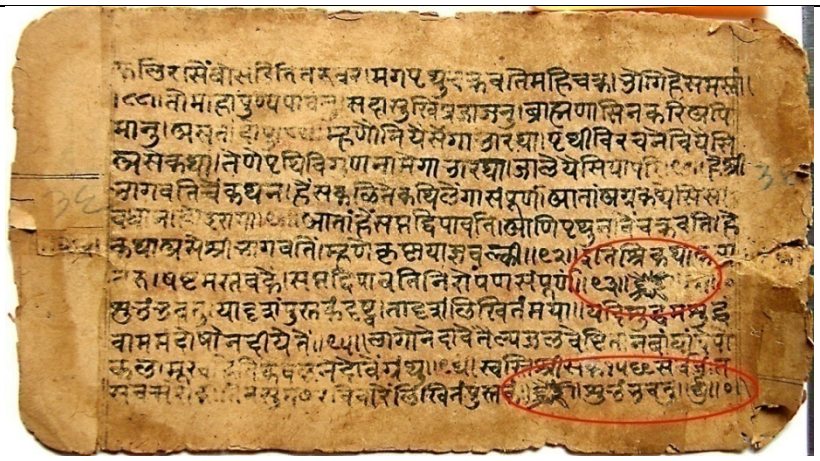
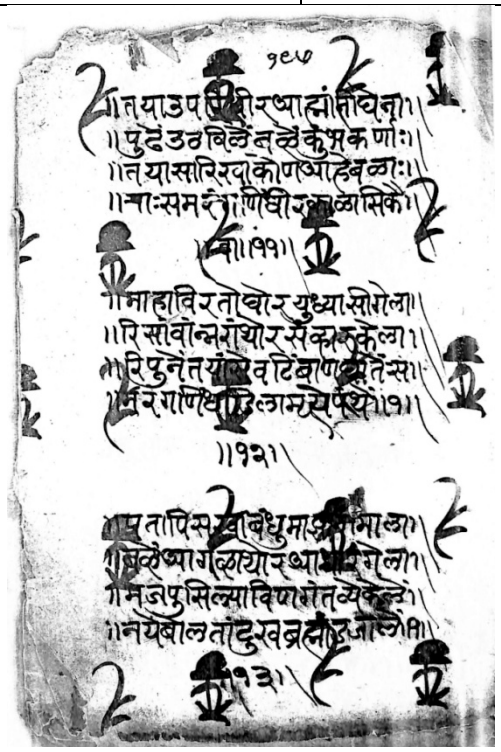
10	**Manuscript Details**	*Kathakalpataru*, BISM, Ac. No. 22/55, 1647 AD	
i)			**Typographic Graphics -** End of chapter graphic symbols
ii)			**Typographic Graphics -** End of chapter graphic symbols
11	**Manuscript Details**	*Shree Samarthakrut Yuddhakandachi Prat*, Bad No. 255, SVM, 17th Century	
			**Illustrations in the Background** Illustrations randomly placed in the background

Table 4.8 - Part 1 (i, ii): Use of floral patterns or geometric lines around the title of manuscript are employed in representative manuscript.

Table 4.8 - Part 2: Illustrations occupied full page area as a section separator and with the title of the section in the center of the layout.

Table 4.8 - Part 3: Image Area Deconstruction

Following is the visual representation of the '*Pateeganita'* manuscripts. Image deconstruction revealed the text and illustration composition pattern employed in the layout. (Figure 4.59)

1. **Division of Space** - Page is divided into ten vertical units and five horizontal units. One unit space from all sides e.g. left, right, top and bottom is left blank as a margin area.
2. **Shape of Illustration Frame** - An illustration is placed within a rectangular frame with double line border.

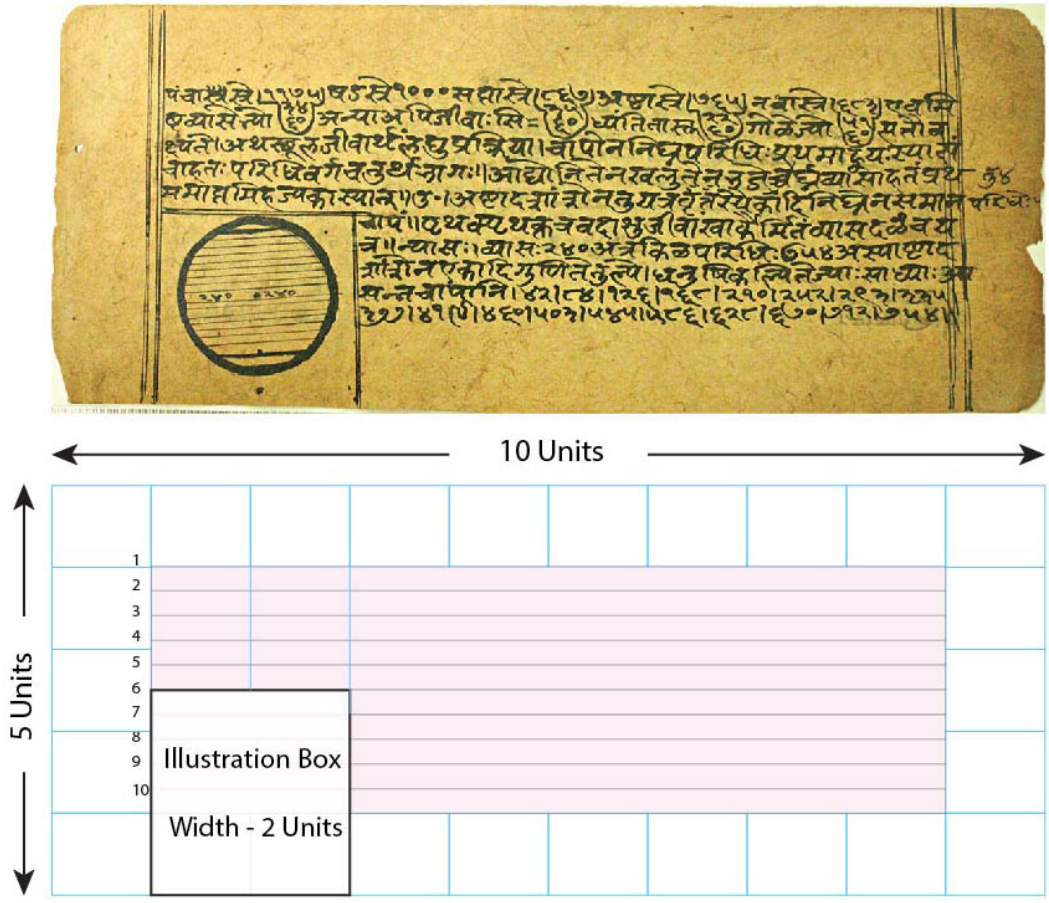


Figure 4.59: Deconstruction of Manuscript and Layout Composition Patterns - Space Organization for Small Size Illustrations, Seventeenth Century Devanagari Brahmanical Manuscripts

3. **The size of Illustration Frame** - The width of this rectangular frame or box is of two units, and the height extends into bottom margin area.
4. **Placement of Rectangular Frame** - It is placed in such a way that the top edge of the frame is aligned with the sixth line of the text block, from the top and it extends in the bottom margin area. The left edge of the frame touches the left *hasia* borders.
5. **Text Wrapping and Inner - Outer Padding of Illustration Box** - Text is found wrapped in a rectangular manner around illustration box. No clear inner or outer padding is observed. It is because the available space is equally divided horizontally or vertically into parts. Columns and gutter space between columns are not observed,

Table 4.8 - Part 4: The space left blank to draw relevant illustration is found in a *Kundamartanda* manuscript page. This is the evidence of the text, which was written first, and a well-defined space was left vacant to draw supportive illustrations.

Table 4.8 - Part 5: Mathematical Tables are placed in line with the text without any padding space.

Table 4.8 - Part 6: Image Area Deconstruction

The representative layout has a narrative illustration drawn on a page along with the text. Figure 4.60 displays deconstructed visual representation method, which revealed following facts:

1. **Division of Space -** A page is divided into eleven vertical units and ten horizontal units. One unit space from all sides, e.g. left, right, top and bottom is left blank as a margin area. (Figure 4.60)
2. **The shape of Illustration Frame** - An illustration is placed within a rectangular frame with two-color border (yellow and red). (Figure 4.60)
3. **The size of Illustration Frame** - Width of this rectangular frame or box is of four units, and height eight units. (Figure 4.60)
4. **Placement of Rectangular Frame** - Illustration is aligned to the left margin and it occupies space from the top edge of margin to the bottom margin as seen in image. Illustration and text block have the same height. (Figure 4.60)

5. **Text Wrapping and Inner - Outer Padding of Illustration Box** - Text is wrapped in a rectangular manner around illustration box. No outer padding, i.e. space between illustration and text is observed. (Figure 4.60)

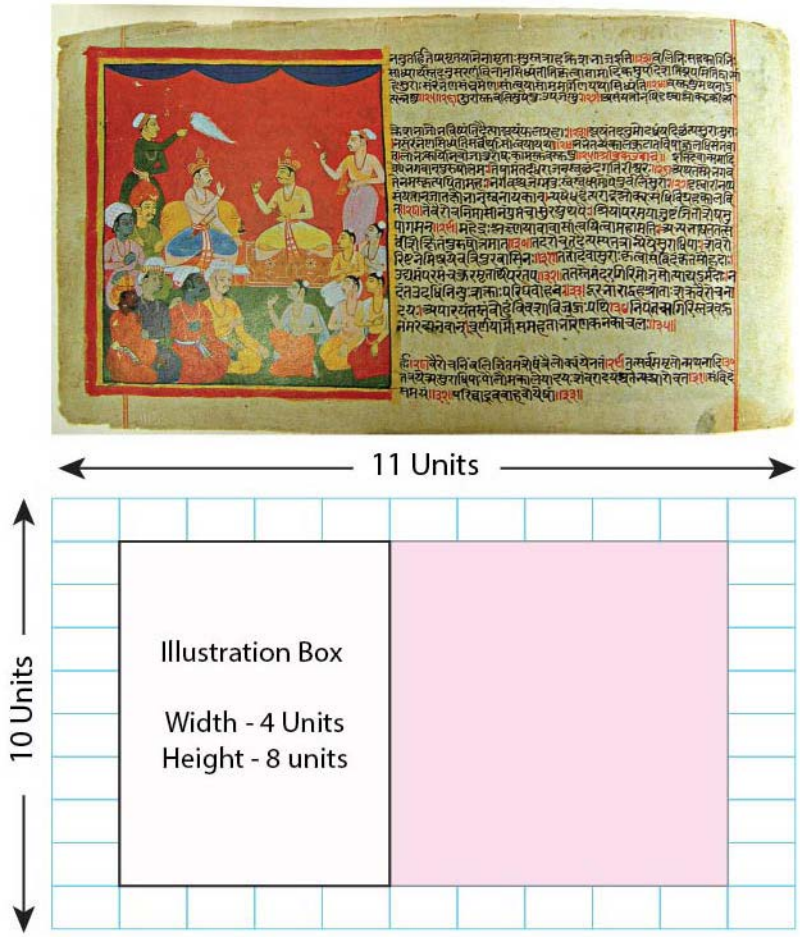


Figure 4.60: Deconstruction of Manuscript and Layout Composition Patterns - Space Organization for Text and Illustration, Seventeenth Century Devanagari Brahmanical Manuscripts

Table 4.8 - Part 7: It is an example of full-page narrative illustration. The margin areas are predefined in the template of this particular page. This is the example where manuscript artist has taken a liberty by drawing illustration beyond the top margin area.

Table 4.8 - Part 8: It is a rare example of the manuscript page without margin borders drawn. This provides artist an advantage to drawn full-page illustration with no limitations of margin area.

Table 4.8 - Part 9: Graphics & Typography - Graphical element e.g. line is used as an accent mark along with text to represent linguistic tone while recitation.

Table 4.8 - Part 10: Graphics & Typography - (i) a symbol marked with red circle is very commonly positioned at the end of section or chapter. **(ii)** a floral motif marked with red circle to denote the end of chapter and the text.

Table 4.8 - Part 11: Illustrations in the Background - Illustrations randomly placed in the background.

4.2.3 (d) b1: Graphic Strategies in Modern Publication Design

The study is concerned about the placement of images and illustrations along with the text in a modern publication design

Approach to Study Graphic Strategies in Modern Publication Designs

Modern books with various genres and layout styles, which include cover pages and inside pages, are observed to study graphic strategies. In most of the layouts, the visuals are composed along with other contents such as text, tables, graphs, infographics, etc. in a layout. The observations are documented in a visual method.

4.2.3 (d) b1 Type 1: Page Layout Compositions with Visual and Text

Visuals on Cover Pages: Full Page photographic images or illustration are placed most extensively on the book cover pages i.e. front and back cover pages along with the typography. (Figure 4.61)

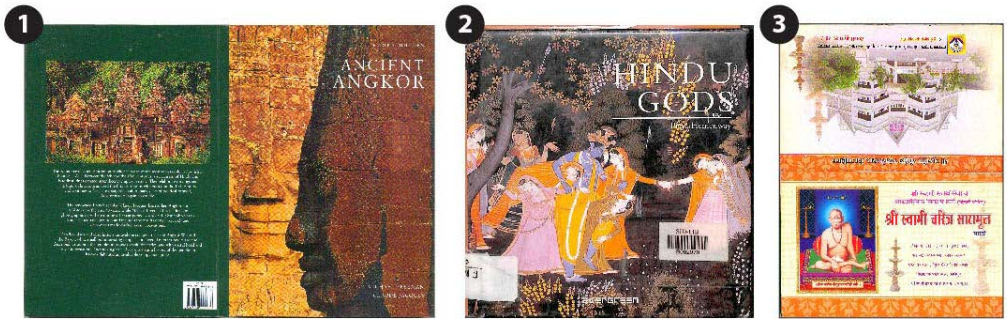


Figure 4.61: Images and Illustrations in Cover Page Designs (Type 1, 2 & 3) - Modern Publication Design. (Hemenway, 2006),

Visuals on Section Separators: Photographic images or illustration are employed in the section separators along with titles as seen in Figure 4.62. Part ❶ shows that image is used only on single page section separator and in Part ❷, illustration is placed across the spread i.e. left and right page.

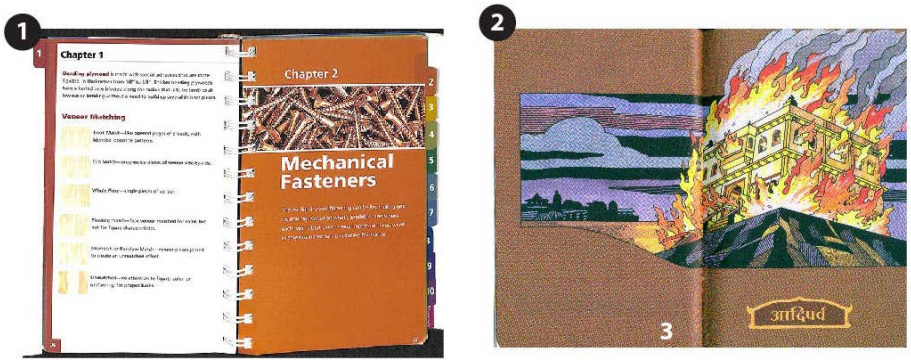


Figure 4.62: Visuals in Section Separators (Type 1 & 2) - Modern Publication Design, Woodworker's (Self, 2005),

Visuals in Chapter Opening and in Inside Pages: Photographic images or illustrations are majorly used on the chapter opening pages to give an overview of the subject as seen in Figure 4.63. Part ❶, which is a magazine page layout and the images are composed interestingly. They have effects such as overlapped and tilted. Although, photographs are not aligned formally, the arrangement shows that they are interlinked. This is a dynamic layout creating rhythm. In Part ❷, an illustrated figure is placed within the article. In Part ❸ illustrated figure shown surrounded by the floral pattern in the beginning of prayer book. In Part ❹, a combination of typography and illustration is visible.

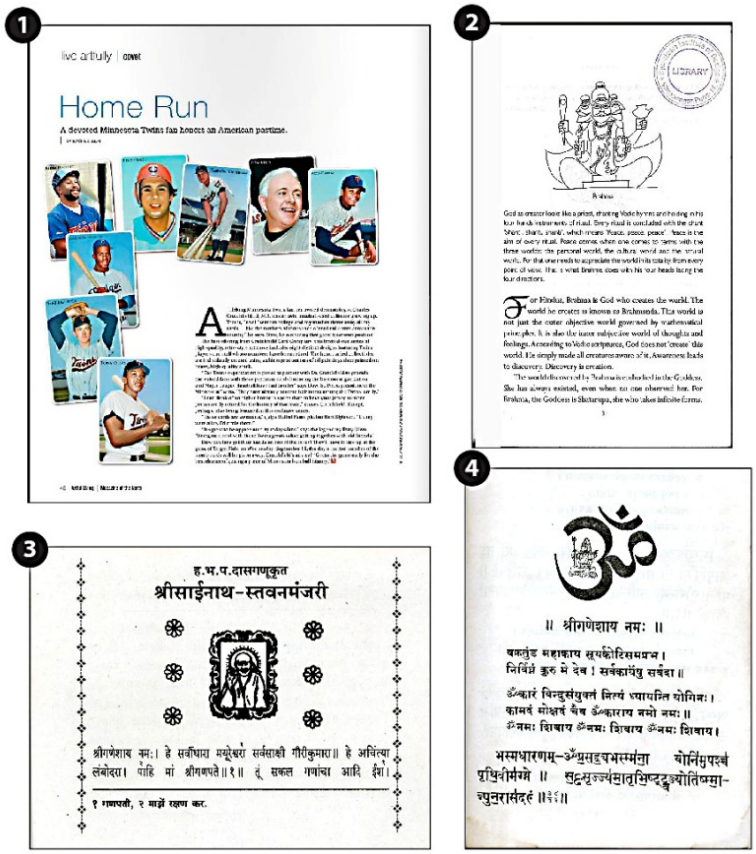


Figure 4.63: Visuals in Chapter Opening Pages (Type 1, 2, 3, 4) - Modern Publication Design

Visuals on Chapter End Pages: Occasionally illustration are placed at the end of the section as seen in Figure 4.64



Figure 4. 64: Illustration Showing End of Chapter - Modern Publication Design (Pangarkar, 1990)

Visuals in the Background: Figure 4.65 is a magazine spread with left and right page. On the left side page, the photographic image is positioned below the text block as a background surface. On the right side page, the image has a lot of white space around it.



Figure 4.65: Images as the Background of the Text, Pages - Modern Publication Design,

Infographics within Pages: Figure 4.66 is book spread page. Infographics, such as graphs and table containing information are placed on the left and right sides of the page respectively. Right side image of Figure 4.66 is an example of illustrated infographics in a 'Tupperware' product catalogue.

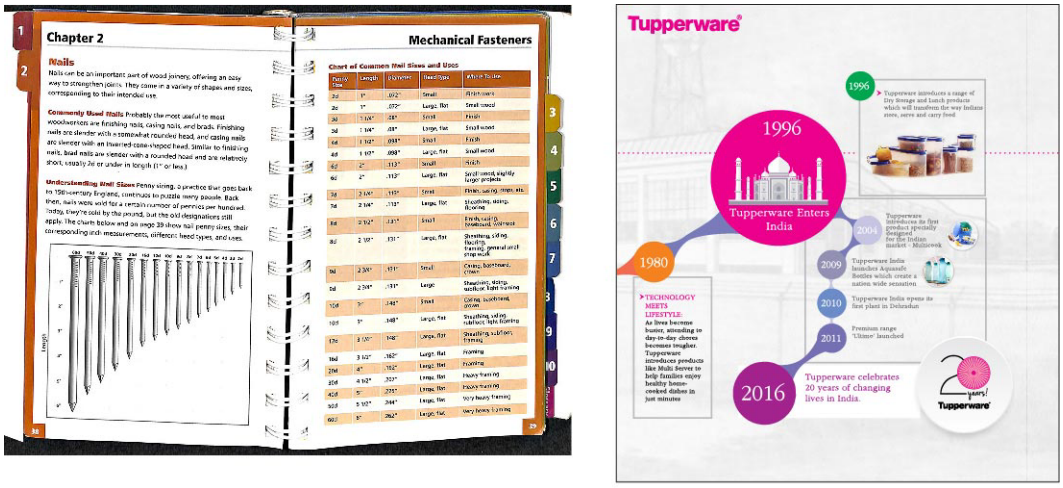


Figure 4.66: Information Graphics and Tables - Modern Publication Design, Woodworker's (Self, 2005),

4.2.3 (d) b1 Type 2: Page Layout Compositions: Images and Text Placement Techniques in Modern Graphic Designs

Following are few representative examples of placement of visual imagery in modern publication designs**:**

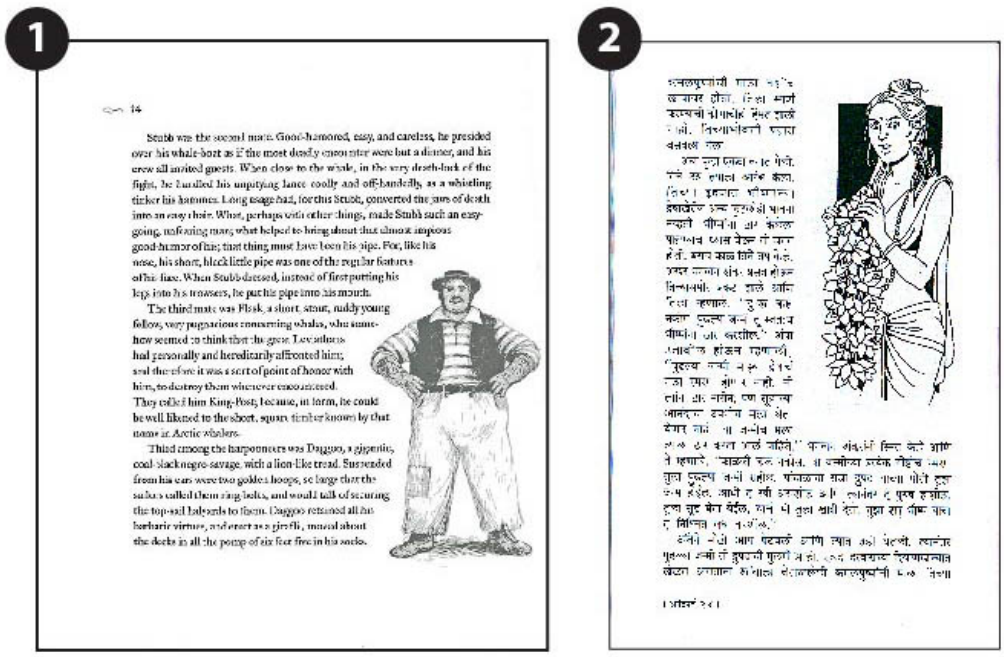


Figure 4.67: Text Wrapping around Visuals - Modern Publication Design, (Benson, 2009),



Figure 4.68: Visual Magnitude on the Page - Modern Publication Design, (Pattnaik, 2006)



Figure 4.69: Visuals Placement within Columns - Modern Publication Design, (Andrews, 2006)

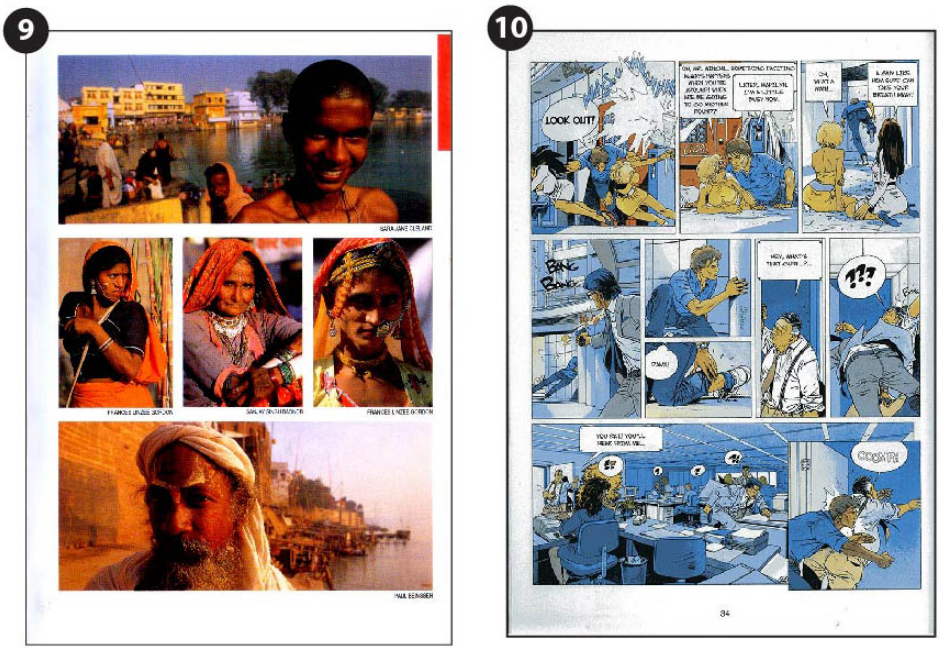


Figure 4.70: Visuals Placement within Modular Grid - Modern Publication Design,

4.2.4 Findings of Theme 2 — Composition and Layout Design: Page Structure, Typography, and Graphic Strategies

4.2.4 (a) Page Anatomy and Structural Components of the Seventeenth Century Devanagari Brahmanical Manuscripts, and Modern Publication Design

A basic structural component which is commonly observed in most of the representative manuscripts selected for the study are displayed in Figure 4.25.

Every manuscript comprises core page layout elements such as:

1. Margins on all four sides;
2. Text block with headline grid;
3. Page navigation system — running title and page or folio number

To demonstrate digital deconstruction of the manuscript, the left, right, top and bottom margin areas are denoted by characters a, b, c, d respectively in Figure 4.25. Text block is an area in which the main text is written, which denoted by character 'h'. This text block is divided vertically into required number of lines depending upon the size of the character. These horizontal lines are known as ‘headline grid’ denoted by ‘i’ in Figure 4.25. Headline grid assists a scribe in not only writing text effortlessly in horizontal line but also align other elements of the page such as running title, folio number, etc. effortlessly on ruled line.

Most common elements of a page structure of the manuscript shown in Figure 4.25 reaveals two different structures for the front and back side of the same folio. Each folio made up of two pages; front side page and a back-side page. The critical observation has revealed that a common practice has to put the number to a folio and not for a page. Folio numbers were aquainted to the reader on only one side of the page. In the current example, the folio number is placed twice on the back side the folio (Figure 4.25). In the first instance, a folio number is positioned on the top left side of the margin and it is below abbreviated running title. In the second instance, a folio number is placed in a right margin area and aligned to the second last headline grid. These finding are broadly similar to research conducted by other scholars.

In modern book design, double spread pages are regularly in practice to design left and right pages. As per the necessity of design, their page layouts are divided into multiple columns and rows with column margin i.e. gutter space between two columns.

It is a general practice that on double spread type pages, a text block along with running title, and page numbers positioned in mirror image style as shown in Figure 4.27.

Page navigation components generally placed in top margin (header) or bottom margin (footer) areas in alignment with the text block. Very rarely it is placed in the vertical center of the left and right margins.

The seventeenth century Devanagari Brahmanical manuscripts made up of a bunch of single folios.

Comparative Analysis: Page Anatomy and Structural Components of the Seventeenth Century Devanagari Brahmanical Manuscripts, and Modern Publication Design

The system of defining page structure is complementary in both the seventeenth century Devanagari Brahmanical manuscripts and modern publication design.

Similarities are observed in basic structural page components of the seventeenth century Devanagari Brahmanical manuscripts and in a modern book design as demonstrated in Figure 4.26 and 4.27 are:

1. Margins on all four sides;
2. Text block with baseline/headline grid
3. Page navigation system
4. Single column grid

Moreover following differences are evident in the page structure of the seventeenth century Devanagari Brahmanical manuscripts and of modern book design. They are:

1. Page layouts with single or multiple columns with gutter space and;
2. Double page spread page layouts with symmetrical or asymmetrical page components

Following exceptions are found in the page anatomy of the seventeenth century Devanagari Brahmanical manuscripts:

- The absence of columns with gutter space in the manuscript page layouts and organization of content using columns with gutter space in the modern publication designs.
- The page spreads were practiced in the seventeenth century Devanagari Brahmanical manuscripts as shown in Figure 4.32. However, a mirror image type of page layout is not noticed in the same because of their top side folding format. Page spreads with mirror image page layouts (Figure 4.27) are regularly practiced in modern page layouts.

4.2.4 (b) Grid Construction and Template Designing

The grid helps in composing various elements such as margin area, text block, an illustration area, page navigation system, etc. on a page layout. The use of deconstruction method has revealed the grid structure and division of space in the page layout of the seventeenth century Brahmanical Devanagari manuscripts and in the modern publication designs.

4.2.4 (b1) Grid Construction and Template Designing — Seventeenth Century Devanagari Brahmanical Manuscripts

Four types of representative manuscripts have been observed for grid construction patterns in the seventeenth century Devanagari Brahmanical manuscripts depending upon their page layout formats and type of content placed on it. These layout formats are as follows:

1. Manuscript with a single column and a single folio page layout format
   (Single text block, landscape format, text oriented)
2. Manuscript with a single column and a double spread page layout format (Single text blocks, landscape format, text, and image)

3. Manuscript with a variation in text blocks sizes; landscape page layout format
4. Manuscript with single text block; portrait page layout format
5. Manuscript with only headline grid; portrait page layout format

4.2.4 (b2) Similarities Recorded in the Grid Construction, Template Design and Page Making Process in the Representative Manuscripts -

- **Defining Page Size:** Template making process begins with deciding final page size of the manuscript.
- **Division of Space:** Manuscript page is divided horizontally into equal size grid as well as vertically in equal parts, creating rectangular modules or units.
- **Modular Grid:** Division of space existing on the manuscript pages are recorded as:
  i) 8 columns & 6 rows - Single folio page layout format - Figure 4.28
  ii) 9 columns & 5 rows - Double spread page layout format - Figure 4.33
  iii) 8 columns & 6 rows - Landscape page layout format - Figure 4.37
  iv) 5 columns & 8 rows - Portrait page layout format - Figure 4.39
- **Defining Margin and Textblock Area:** Once the modular grid structure is formed, one unit on the edges of the page defined as a margin area. This resulted in creating left, right, top & bottom margin, denoted as ‘a’, ‘ b’, ‘c’, & ‘d’ respectively.
- Area or units which fall inside after deciding margin area on the manuscript page is utilized as a text block for writing text. It is denoted as ‘h’ in deconstruction figures. (Figure 4.28 - Step 3, Figure 4.33, Figure 4.37 - Step 2, Figure 4.39 - Step 2)
- ***Hasia* Lines or Margin Border Lines** - Margin borderlines are drawn on left and right side. Lines are drawn on the left and the right side edges of text block. The purpose of these vertical guidelines was to indicate scribe for writing text in defined space.
  (Figure 4.28 - Step 4, Figure 4.33, Figure 4.38 - Step 3)
- **Making Headline Grid for writing Text** - Depending upon the size of syllable and number of characters to be fitted in one single line, equidistant horizontal lines are drawn to create headline grid. Headline grid is a division of text block using the horizontal lines. The text is written on these horizontal lines.
  (Figure 4.28 - Step 4, Figure 4.35, Figure 4.37 - Step 3-4, Figure 4.39 - Step 3, Figure 4.40, Figure 4.41)

- **Positioning Page Navigation Content** - To define a place for page navigation system i.e. running title and page number. The observations reveled that sometimes abbreviated running title and folio numbers are placed together, one below the above or running title or folio number only one at a time. The page navigation content is mainly placed at two places. In the first instance is running title and folio number positioned in left margin aligned with the first line of text block i.e. flow line. In another instance, it is placed in the right margin area aligned at the bottom of text block using two lines of the headline grid. (Figure 4.28- Step 4, Figure 4.35, Figure 4.40 - Step 4)

All above steps ultimately make the symmetrical page template ready to write or to draw an illustration.

- **The composition of Text on Page** - Using the template created through the previous steps, the text is written on headline grid and compose a final page layout. (Figure 4.28 - Final Layout, Figure 4.35, Figure 4.36, Figure 4.35, Figure 4.38 - Step 5).
- **Space Planning for Illustrations** - A specific area is left blank for the purpose of drawing text supportive illustrations. The Figure 4.35 - 4.36 displays a rectangular blank space in the manuscript page. This rectangular space is aligned with the right margin and is measuring two units width and six headline grid line height. The upper and lower parts of illustration are further aligned with headline grid.

4.2.4 (b3) Differences Recorded in the Grid Construction, Template Design and Page Making Process of the Representative Manuscripts

The observations recorded in the study has revealed that the division of space, in the case of manuscripts with single text is very simple (Figure 4.28, Figure 4.33). It is a modular grid construction. In the case of multiple text manuscripts, the grid framework and the organization of information becomes complex as represented in Figure 4.37 e.g. *tripatha* manuscript, which has main text (*mula*) and commentary (*titka*).

Case Study 1 — Type 2: Manuscript with Multiple Text Blocks with Variation in Sizes, landscape page layout format (Figure 4.37 - Figure 4.38)

- **Division of Space:** The case study of *'Ragaibodh'* has revealed that three horizontal sections of the page are easily visible. In this layout, the main text is composed in

the vertical center of the page, and the commentary is placed in the area above and below it (Figure 4.37). This page layout style is known as '*Tripatha'*.

Here two different types of grid structure employed for the division of the space.

i) Main Grid Structure for Commentary *(Tika)* - This is a similar process as followed commonly for the division of space. (Figure 4.37 - Step 2 - 3).

- A page is divided into eight columns and six rows (Figure 4.37 - Step 2 -3).
- One unit area on the all four sides of the page is defined as a left, right, top and bottom margin area. (Figure 4.37 - Step 2 - a, b, c, d)
- Text block comprises of six horizontal and four vertical fields (Figure 4.37 - Step 2 - 'h'). Further, the text block is divided into thirteen headlines.
- Within the text block area, one horizontal field (one unit height size) on the top and the bottom were used for commentary and the two fields (two units height size) in the vertical center were used for the main text (Figure 4.37 - Step 3).
- Each field height comprised three headlines.

ii) Grid Structure for Main Text *(Mula)*- Main text area, i.e 'h1' (Figure 4.37 - Step 4), is constructed by dividing the total horizontal place into six vertical divisions. One part at the left and the right side ends are defined as left and right margins. This division has reduced the width of main text area than the main grid structure. The result of this division is: the left and the right side margin width happen to be bigger than the margin used for commentary text block.

- **Positioning Page Navigation Content** — The page number is placed exactly in the vertical center of right margin area near the text block margin line (Figure 4.38 - Step 4).

Thus, a symmetrical template for page layout is created.

Case Study 2 — Type 3: Manuscript with Modular Text block; Portrait Layout Format (Figure 4.39 - Figure 4.40)

- A representative manuscript is selected for the study of the single text block, portrait page layout formats are *Shree Samarthakruta Yuddhakanda Prat'* (Figure 4.39 - 4.40). To create a basic division of space, the similar process of grid construction seen before is to be followed.

- **Division of Space:** Manuscript page is divided horizontally into five equal size columns and vertically into eight equal size rows (Figure 4.39). A margin area is defined using one unit size on all four edges of the page. To define left, right, top and bottom margins (a, b, c, d) and the text block (h) area follow a similar pattern as seen in Figure 4.39 and Figure 4.40.

Key Features — Division of Text Block Area

- Systematic and thoughtful division of space created in this composition, which is based upon the rhetoric style of writing.
- This composition is a collection of verses written in a poetic meter *'Jagati'*. The peculiarity of this that, meter is it consists of forty-eight syllables distributed in four verses (lines), and each verse is made up of twelve syllables.
- Taking into account the prosodic pattern, the text block is divided into twenty-one horizontal lines used as headlines to write a text. Grid is developed as a series of rectangles in which three stanzas incorporated on one page, it is represented in Figure 4.40 - Step 4.
- Finally, the information is organized on the page as three units made of four lines each.
- **Positioning Page Navigation Content —** Each stanza is written in four verses in four lines following the *Jagati* meter. A gap of three lines is found maintained between every stanza. A stanza number is placed in the horizontal center and vertically in the center of first two lines that left blank after the stanza. That means poetry is written using line number 1 to 4. Line number 5 to 7 are left blank, and the stanza number is written in the vertical center of line number 5 and 6. Line number 7 is again left blank as an extra paragraph space between two stanzas. The visual representation is shown in Figure 4.40 Step 4 - 5.

Thus, a symmetrical template for page layout is created.

Case Study 3 — Type 3: Manuscript with Modular Text Block; Portrait Layout Format (Figure 4.40 - Figure 4.41)

A representative manuscript, namely '*Kalyanpotha'* selected for the study of the modular text block is of portrait page layout formats.(Figure 4.401- 4.42).

- **Division of Space** — A grid construction method followed in the division of space is completely different from all other patterns seen before.

Key Features - Division of Text Block Area

- A page is first horizontally divided into thirty eight horizontal lines, thus developing headline grid first. (Figure 4.41 - Step 2)
- Later, for the top and bottom margin area two rows of headline-grid is occupied. (Figure 4.41 - Step 3)
- For text block, a grid is developed as a series of rectangles depending upon the rhetoric style chosen. Each text block comprises one stanza made of two lines, and a third line consistently kept empty. On every page eleven stanzas are planned.

Positioning Page Navigation Content — A single line row purposely kept blank between each stanza and its number is placed in the horizontal center of this blank row. It is represented as ‘v’ in Figure 4.42- Step 4.l

The salutation of god is written in the top margin area in the second line. Folio number which is denoted by ‘f’ in Figure 4.42 - Step 4, is positioned in the first row and aligned to the right edge of the text block. Thus, an asymmetrical template of page layout is created.

4.2.4 (b4) Modern Publication Design — Grid Construction and Template Designing

Exploration of grid construction in modern books has revealed variety of grid types used in the page layout. Modern books with single and multiple columns with both portrait and landscape layout formats are selected for the study. These books pages are bound on either the left or the top edge of the book.

Page layouts with following types of grids are observed in modern book designs. These grid structures virtually divide the space into horizontal and vertical parts:-

i) **Single Column Manuscript Grid** - Grid with one text block is used in novels, essays, reports, religious books and scholarly works (Figure 4.43, Figure 4.44).

ii) **Multicolumn grid** - It gives more flexibility in placing the content on the page and it mainly used in the magazines. (Figure 4.45, 4.46, 4.47)

Two columns widths can be symmetrical (Figure 4.50) or asymmetrical (Figure 4.51)

iii) **Multicolumn Modular Grid** - Modular grid is used for the complex type of information e.g. tables, charts, product catalog, newspapers, etc. It creates modules or chunks of space (Figure 4.46)

iv) **Mix Grid Layout** - Layouts with combination of various types of grids (Figure 4.52)

vii) **Hierarchical grid** - Grid divides space horizontally. The representative example is of commentary type of layout in which main text displayed in the top part and commentary displayed in the second part of the page (Figure 4.53)

viii) **Golden section grid** - Grid used in the page of booklet applied the principle of design 'contrast' between sizes of elements to show visual hierarchy (Figure 4.54)

ix) **Baseline grid -** Every text block is comprised horizontal lines to write a text on it. The text is placed in the horizontal direction within the text block area (Figure 4.43 - Step 3, Figure 4.44 - Step 2, Figure 4.46 - Step 3, Figure 4.48 - Step 4)

General Steps observed in Grid Construction, Template Design and Page Making Process of Modern Publication Design are:

- **Defining Page Size** - Decide format of the book and trim the size of the book by selecting appropriate paper size (e.g. A4) by sub-dividing existing available paper size (e.g. A0). (Figure 4.40 - Figure 4.45)

- **Defining Margin and Text Block Area** - Define suitable space for left, right, top, bottom margin areas depending upon binding type chosen. This procedure creates margins and text block area. (Figure 4.43 - Step 1 & 2, Figure 4.44 - Step 1, Figure 4.45 - Step 1, Figure 4.46 - Step 1)

- **Division of Text Block Area** - Text block area is divided into expected number of columns with space between i.e. gutter space. Further text block is divided into rows and columns (Figure 4.45 - Step 2, Figure 4.48 - Step 2 & 3). This process is also divided a page into a modular grid.

  Generally, a text block is divided into two to twelve numbers of columns (Figure 4.45 - Step 2). It makes easy for a designer to create units comprising 2, 3, 4, 6, 8 number of columns with gutter space.

The digital illustration demonstrated shows how the text block is divided into three rows and tweleve columns in Figure 4.45 - Step 2. Each column and row have a breathing white space in between, known as ‘gutter space’. These divisions of working space treated as building blocks to create modules, which are combination of multiple columns. In these modules various categories of information is placed as per the volume of data (Figure 4.71).

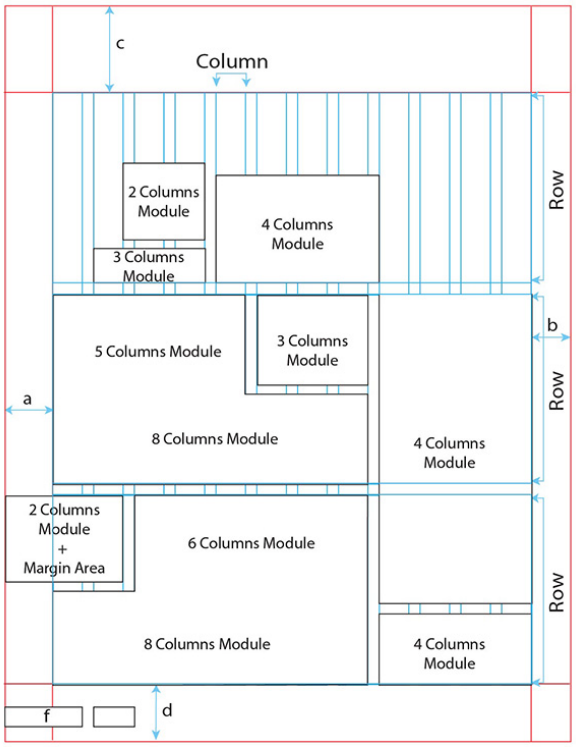


Figure 4.71: Building Blocks of Grid - Columns and Units, Modern Publication Design

- **Baseline Grid** - By taking decision of typesize and leading space, a baseline grid is created (Figure 4.43 - Step 3, Figure 4.44 - Step 2, Figure 4.46 - Step 3).
- **Modular Grid** - A multicolumn and moudlar grid observed in a magazine to display weekly horoscope, represented in Figure 4.48. In this example, 4 modules are created per column, and each module has a line count of 9 in a chosen font size (Figure 4.48 - Step 3 & 4)
- ***Hasia* Lines or Margin Border Lines** - Majorly in most of the book layouts with portrait format and top binding type, margin borders are not observed; however, it is observed in the Devanagari holy/prayer books written in the *pothi* format (landscape page format and top side binding).

The example shown in Figure 4.44 is a landscape format prayer book with top side binding. It is written in Devanagari script, and floral hasia borders are observed.

Figure 4.44 is an example that reveal page layout design is adopted from the seventeenth century Devanagari Brahmanical manusctips. It includes: landscape page format, template making - baseline grid, page navigation system, *hasia* lines, etc. Continuation of design with enhancement has been noticed.

- **Positioning Page Navigation Content** - It is observed that page navigation system comprises running title, page numbers, date and volume details of publication, etc. Three types of placement positions have been noticed in a page navigation system in modern publication designs.

  i) In most of the page layouts with portrait formats and left side binding type, page navigation details are placed in the header and footer zones. If the publication is in the double spread book format then navigation system placed at mirror image locations. For example, on the left (verso) side page, navigation content is placed in the left side margin area and in the right (recto) side page navigation content is placed in the right margin area (Figure 4.43).

  ii) In the page layouts with landscape formats and top side binding type, a page navigation system is placed in the left and the right side margin area (Figure 4.44).

  ii) Page navigation system is also arranged in entire left, center and right header or footer area (Figure 4.47,4.48, 4.49, 4.50, 4.51) along with other graphic elements.

Thus, a template is ready to place or import contents such as text and visuals.

Composition of Text on a Page - Using the template created in previous steps, the text is written on headline grid to compose a final page layout. (Figure 4.25 - Finally Layout, Figure 4.44, Figure 4.46, Figure 4.48)

Space Planning for Visuals - Various types of visuals are employed in the page layouts. It is discussed in advance in a ‘Graphic Strategies - Modern Publication Design’

4.2.4 (b5) Comparative Analysis: Grid Construction and Template Design in the Seventeenth Century Devanagari Brahmanical manuscripts and Modern Publication Design

Similarities Recorded:

1. All representative examples confirmed that the page layout templates are created in both the seventeenth century Devanagari Brahmanical manuscripts and the modern publication designs before starting the job. It is one of the publication design planning process.
2. Other common fundamentals features have observed in both the page layouts and grid construction planning are: the use of margin, text block area, baseline / headline grid, page navigation system, and space organization for visuals.
3. One among the ten representative modern publications is selected for the layout grid study (Figure 4.44) followed the similar technique for the division of space as seen in the seventeenth century Devanagari Brahmanical manuscripts. In this example, the page is divided horizontally as well as vertically in equal parts, thereby creating rectangular modules or units. Once a modular grid structure is formed, one unit field on the edge of the page is defined as the margin area, and the rest of area is utilized as a text block.
   (Manuscript grid - Figure 4.28, 4.32, 4.33, 4.34)
   (Modern Publication Design - Figure 4.43 - Step 1 & 2).

   Later headline grid is created in the text block area depending upon the required font size and leading (Figure 4.28 - Step 3). The text is placed or typed in the text block area (Figure 4.38 - Step 4).
   (Manuscript headline grid - Figure 4.28, 4.29, 4.30, 4.35, 4.37, 4.38)
   (Modern Publication Design - Figure 4.43, 4.44, 4.46, 4.48)
4. One among the ten representative modern publications is selected for the layout grid study (Figure 4.44); it followed the identical page format, grid structure, headline grid, page navigation placement areas, as seen in the seventeenth century Devanagari Brahmanical manuscripts. It is a *pothi* style page layout, still practiced in Maharashtra for designing and printing holy books with similar design elements.
5. Grids in layout – Two types of grid construction found similar in both the seventeenth century Devanagari Brahmanical manuscripts and the modern publication designs. They are single column grid for single text block and

hierarchical grid. Single column grid is a very common format. The hierarchical grid is employed thoughtfully in the seventeenth century by using *tripatha* style grid, by placing main text in the vertical center of the page and commentary above and below (Figure 4.73) but in modern publication, design text is placed one below and above. In both the structures, space is divided horizontally (Figure 4.72).

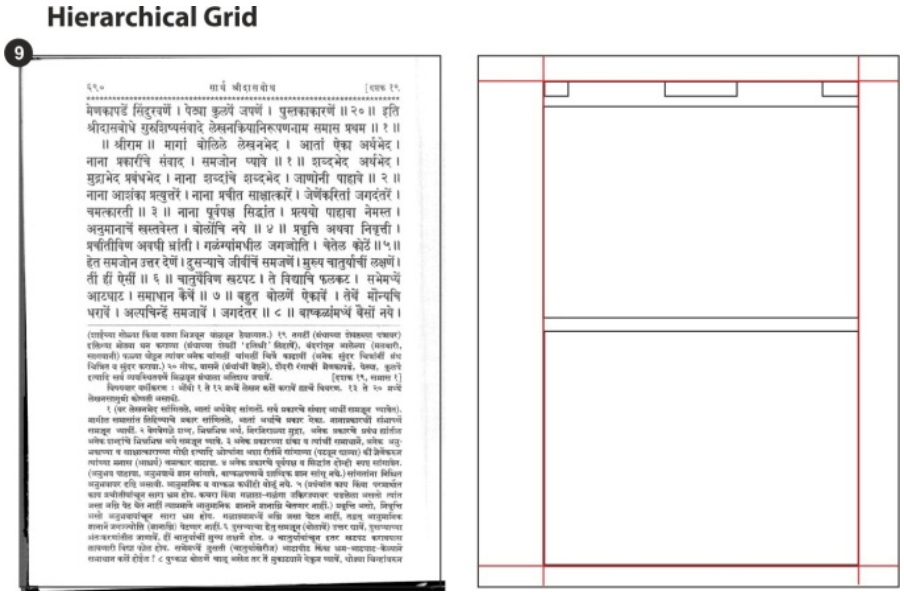


Figure 4.72: Hierarchical grid in Modern Publication Design, (Pangarkar, 1990)

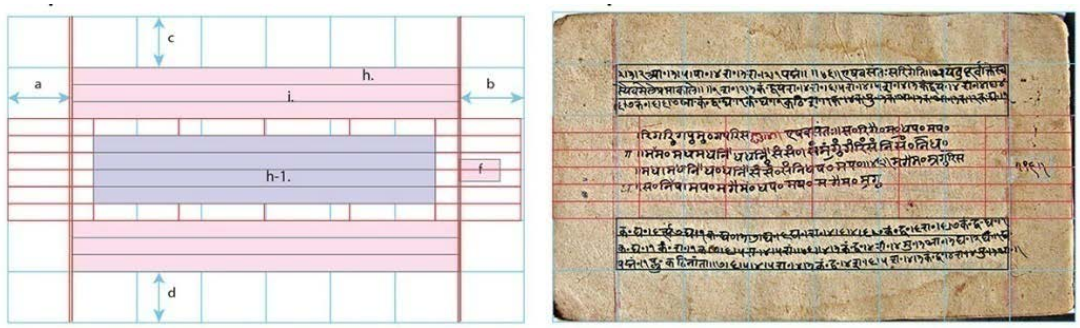


Figure 4.73: Hierarchical grid with *Tripatha* page layout, Seventeenth Century Devanagari Brahmanical Manuscripts, *Ragavibod*, 1618 AD

Dissimilarities Recorded:

1. The absence of columns with 'gutter space' i.e. space between columns in the page layouts of the seventeenth century Devanagari Brahmanical manuscripts.

2. **Features of the seventeenth century Devanagari Brahmanical manuscripts**
   i) A single column grid is developed to build up the formal balance in page layouts
   ii) A page layout has equal unit margin areas on four sides. It is defined by selecting one unit field from all four sides page.

iii) An overall placement of content followed justified alignment strategy in the layout

3. **Features of the modern publication design-**
   i) Depending upon the function of the book, variations found in the practice of grid, e.g. single column, multicolumn, modular, hierarchical grid, etc. with the horizontal and vertical division of space i.e. rows and columns.
   ii) For every page layout, the margin areas have been defined as per the requirement of the job, with aspects related to printing and binding techniques. All four sides of the margin can be of different size as displayed in Figure 4.46.
   ii) Construction of grid structures is mainly of two types: symmetrical or asymmetrical.
   iii) Multicolumn grid based page layouts with rows, columns, and baseline / headline grid have provided ease in arrangement of content on page layouts
   iv) These layouts are more dynamic, and the formal balance is achieved by using various design principles

4.2.4 (c) Typographic Palette — Typestyles and Alignments

4.2.4 (c1) Typestyles – Seventeenth Century Devanagari Brahmanical Manuscripts

Table 4.6 Represents features related to typestyles observed in the study of representative seventeenth century Devanagari Brahmanical manuscripts. They are as follows:

- Typestyle with mainly three categories observed in handwritten manuscripts, and they are expressions of the individual scribe. These categories can be defined as handwritten style, handwritten daily writing style, and calligraphic style.
- Characteristic of gray values of these handwritten manuscripts includes a variety such as light, medium, and dark (bold).
- Once the type style and gray value are decided, consistency was maintained throughout the manuscripts unless there was a change in the scribe.
- The size of the text is readable and the style followed is legible.

- In the case of the calligraphic text, the fluid cursive extensions or pen flourishings are observed for terminals and vowel symbols. (Sr. No. 3, 5, 6, 7)
- Written aesthetically with consistency in lettering (Sr. No. 6). Inconsistency in the form of lettering is also noticed. (Sr. No. 4)
- Metrical literature (Sr. No. 5, 6)
- Coloured punctuation marks (Sr. No. 6)
- Number of characters per line ranges between 24 and 58
- Number of lines per page ranges between 12 and 17
- Variation in the text size observed between main text and commentary. However, main text size is bigger than the text size of commentary. (Sr. No. 7)

4.2.4 (c2) Text Alignments — Seventeenth Century Devanagari Brahmanical Manuscripts

Justified, the most widely practiced / accepted paragraph alignment is noticed for writing the seventeenth century Devanagari Brahmanical manuscripts. 'Justified' is the type of alignment in which the text is adjusted in such a way that all lines of the paragraph reach until both — left and right side of the margins.

Interestingly, variations are observed in the last line of the text block. The observations documented as follows:

1. **Justified Alignment:** Entire text block has applied justified paragraph alignment (Table 4.7 - Type 1).
2. **Justified Alignment with supportive Graphic Elements:** In the last line, where characters are insufficient to occupy entire horizontal space within margin area. Therefore, by adding specific symbols and characters the last line is successfully justified. These symbols and characters are mainly employed in-line with text to show the end of the text and placed in the unfilled space at the end of the text or chapter (Table 4.7 - Type 2).
3. **Center Alignment:** The last line of the text block, which states the information related to date is centered aligned (Table 4.7 - Type 3). The second last line, which is actually an end of the text is successfully justified by adding specific symbols and characters to show the end of the text as seen in Table 4.7 - Type 2.

4. **Indented Justified Alignment:** A page layout of this example is of *tripatha* type. In this layout, the text block of the main text is placed in the vertical center of a page with left and right indentation and with justified paragraph alignment (Table 4.7 - Type 4).
5. **Left Alignment (Flush Left):** The last line of the text is left aligned (Table 4.7 - Type 5).
6. **Drop Line Text Alignment:** In the *tripatha* style, the page layout paragraph alignments are justified. In this example, the third paragraph that comes after the main text is noticed indented. Each of these indented paragraphs begins at a new position as they start where the last of the previous paragraph ends. That is why this type of alignment is known as drop line text alignment (Table 4.7 - Type 6). Space to indent text is decided as seen in Figure 4.37, using grid, i.e. division of space.
7. A flush right type of text alignment is found missing in the page layouts

4.2.4 (c3) Typestyles —Modern Publication Design

Today in modern publication designs, the digital technology has provided flexibility to graphic designers in the selection of the fonts. By choosing appropriate font for the text creates interest in page layouts. There are umpteen numbers of typefaces with various weights such as regular, thin, bold, bold italics, extra bold, italics, etc. are available today.

The observations recorded from the data collected are related to modern publication designs and complied together in Figure 4.55. The observations show the use of typefaces with variety in size and typestyles. They are as follows:

1. A representative cover page of modern publication design (Narale, 2014) with four different typefaces are applied in the layout. Display type font with decorative typestyle is used for the title of the book (*Sanskrit Primer*). This type has thin and thick strokes and the serifs are extended with ball shape. Other information on this page is comparatively in smaller font size. (Figure 4.55-Part ❶)
2. A representative sample of the title page of publication design (Pangarkar, 1990) in which chunks of information are clearly visible in the layout. Every chunk of information is represented by variety in the font, size, and other attributes such as normal and bold types. Heading ‘*Sartha Sri Dashbodaha'* has display type font,

which is the biggest size text in the current page layout. Decreasing order of type size is applied to display other information as per their level of importance. (Figure 4.55-Part ❷)

3. A representative sample of the weekly magazine inside page (2016, p. 2) shows variation in following areas such as: typefaces selected, sizes selected for titles / headings, subtitles, section, text in the header area, drop capital or initial, body text, photo caption, and index entry, etc. The use of initial or drop capital applied where the main story begins. (Figure 4.55-Part ❸)
4. A representative sample is a combination of index and title page of a weekly magazine (2016, p. 18). The layout shows variation in a typeface, and their sizes in titles, author names, page numbers in the index entry. Consistency in the use of colours, typefaces and their attributes is maintained throughout for the information such as chapter title, author names, page numbers, etc. In publisher's details area, the typefaces selected for headings are bold and information below it is of regular style. (Figure 4.55-Part ❹)
5. A representative sample is a mathematics textbook (*Mathematics Book*, Class X, 2007). In this layout, three different typestyles are easily visible: they are heading, sub-heading and body copy. Consistency in typeface, size, and colour for these three types of information is maintained in the entire book in all the chapters. (Figure 4.55-Part ❺)
6. A page from a product catalogue (*Tupperware Catalogue*, 2016) shows four types of information. Each type of information is shown with a different typeface and in decreasing order of size. The text within quotation marks is bigger in terms of size than other text. The product particulars are displayed in a smallest size. (Figure 4.55-Part ❻)

4.2.4 (c4) Text Alignments — Modern Publication Design

Four basic types of text alignments are commonly practiced in modern publication designs. They are documented in Figure 4.51 and are as follows:

1. Paragraph Alignment — Left (Padgaonkar, 2012) (Figure 4.56-Part ❶)
2. Paragraph Alignment — Right (Lokasatta, 2016) (Figure 4.56-Part ❷)
3. Paragraph Alignment — Center (Purandare, 2009) (Figure 4.56-Part ❸)
4. Paragraph Alignment — Justified (Sainath Sagunopasana) (Figure 4.56-Part ❹)

5. Paragraph Alignment — Tapered Center, used very rarely in modern publication designs (Figure 4.57)

Generally, different text alignments are used in combinations as seen in Figure 4.57 and Figure 4.58.

Figure 4.57 is an index page of the representative modern publication design, has multiple text alignments for every category of information. The title of book and the index title are center aligned. A tapered center alignment is employed in the paragraph showcasing brief about the section. The book sections and this chapters within sections are left aligned and the page numbers are right aligned.

Figure 4.58 is an inside page of a selected representative modern publication. It is an example of the combining multiple alignments for multiple types of information. Three types of information seen in a page layout are: image, section title and text block. The image is placed near the right margin and it is aligned to the right side of the text block. Section title has left alignment. The text block has justified alignments.

4.2.4 (c5) Comparative Analysis: Typographic Palette — Typestyles and Alignments in the Seventeenth Century Devanagari Brahmanical manuscripts and Modern Publication Design

Typestyles and Alignments in the Seventeenth Century Devanagari Brahmanical manuscripts

Once the calligraphic style is defined, a manuscript artist must have tried to maintain consistency in the type size, weight and gray value of the type throughout the manuscript.

The observations revealed that most of the manuscripts are designed with no variations in the type size. The entire text of the manuscript is written in the same type style and type size. These designs without contrast led to monotonous and uninteresting layout.

The manuscripts main text is generally written in justified text alignment. In cases, if there is a less text to occupy the entire line, then a few graphic icons are added to complete the line. In few cases, a disparity of alignment is observed only in the last line of the text e.g. left, and center.

Indentation used in two ways in the manuscript layouts:

i) The first line of the main text paragraph indented very innovatively by employing drop line text alignment. However, the overall text alignment is justified.
ii) Left and right indentations are applied for the paragraph in *tripatha* style page layouts.

Typestyles and Alignments in the Modern Publication Design

Although umpteen numbers of fonts are made available by digital technology, graphic designers employ few selective and limited fonts in the page layout designs. e.g. headline, sub-heads, body copy etc. These type styles are continued throughout the document to maintain consistency. It also helps the reader in comprehending a particular type of information.

Variations in type size and the attention seeking display types for headings in design generate excitement for the reader. It makes page layout dynamic and adds rhythm to the layout. Big heading and subheading guide reader taking a glance at the article by getting a gist of an article from long distance also.

Contrast in size and weight of type size works as a visual hierarchy so as to attract the readers' attention while reading the order of information, e.g big size to the smallest size.

Mainly, the left, right, center and justified types of alignments are applied for paragraphs as per the requirement of the layout. Alignments are used in combination. In text-heavy paragraphs, it is observed that the paragraph alignment is justified but, the last line of the paragraph is left aligned. It is because of the reading pattern direction of the script, i.e. from left to right (Devanagari and Roman Script)

Alignments also show association with other content in the layout.

Tapering type of alignment is very rarely used in modern page layouts.

In most of the examples, the first line of the paragraphs is indented.

4.2.4 (d) Graphic Strategies

4.2.4 (d1) Graphic Strategies – Seventeenth Century Devanagari Brahmanical Manuscripts

Images displayed in Table 4.8 are the representative examples of various patterns noticed in the seventeenth century Devanagari Brahmanical manuscripts highlighting the composition strategy for the illustrations and the text together in page layouts.

The observations recorded regarding graphic strategies are employed in a page layouts of the seventeenth century Devanagari Brahmanical manuscripts are as below:

1. Graphics employed in the manuscript page layouts can be categorized as diagrams, narrative illustrations, tables, and charts and typographic graphics.

2. Graphics are placed in the manuscript page layouts for diverse reasons:
   i) Cover page designs (Table 4.8 - 1)
   ii) Section separator (Table 4.8 - 2)
   iii) Text supportive illustration - small size (Table 4.8 - 3)
   iv) Inline tables or charts (Table 4.8 - 5)
   v) Narrative illustration - big size (Table 4.8 - 6)
   vi) Full page illustration within margin area (Table 4.8 - 7)
   vi) Full page illustration without margin area (Table 4.8 - 8)
   vii) Integration of elements of design, e.g. line within typographic in certain manuscripts as linguistic features of the Devanagari script (Table 4.8 - 9)
   ix) Typographic symbols to denote end of chapters, section, etc. (Table 4.8 - 10-i)
   x) Floral symbols to denote the end of chapters, section, etc. (Table 4.8 - 10-ii)

3. **Defining the size of Illustration using Page Template**: As seen in the earlier section of ‘Manuscript Grid and Template Designing’ process and the text block space is divided into equal horizontal and vertical units.

   Later, in case where text and illustration are composed together in a page layout, space is defined for both. The area defined is meticulously aligned with headline grid or with unit fields as shown in Figure 4.59 and 4.60. While writing the

manuscript the illustration area was left blank. Artist utilized this area to draw a supportive illustration. (Table 4.8 - 4)

For illustrations the entire page area is occupied within margins; the unit field marking in the template area is not necessary. In such cases, only margin borders are drawn as a reference for the image area. (Table 4.8 - 7)

A unique example of a full-page illustration is also noticed in *Kalyanpotha* manuscript as shown in Table 4.8 - 8. In this manuscript particularly, no margin lines are drawn physically, however, they are defined by a grid in the template design process.

4. **Illustration frame details**:

Shape: Illustration frames observed in representative manuscripts are of rectangular shape.

Border: Generally, double line border is drawn around the frame in mono colour (Table 4.8- 3, 5) or duo colour painted borders (Table 4.8- 6)

Padding for illustration frame: Padding is the inner and outer white space around the illustration.

No clear padding space is defined in the template design process of the manuscripts. It does not provide a clear area for the scribes and for illustration artist. The result is overwriting and over a painting in the margin as well as in the illustration frame area.

Figure 4.74 is a enlarged view of the manuscript *Bhagavata Purana* (Table 4.8 - 6) with areas of text written beyond margin lines (part ❶), illustrations extended beyond the margins (part ❷), and text and illustration borders overlap each other part ❸). This is a drawback of template designing pattern followed in the manuscript designing. (Refer Figure 4.59 for template of manuscript)



Figure 4.74: Approach of Scribe and Artist in writing and drawing content using manuscript template - Seventeenth Century Devanagari Brahmanical Manuscripts

5. **Typographic graphics** are employed in the text to denote end of the chapter, section as well as to justify the text / paragraph alignment as seen in Table 4.7 - Part 2, 3)

6. **Illustrations in the Background:** It is a very rare example of the seventeenth century in which two motifs placed as a background pattern alternatively, behind the text.

4.2.4 (d2) Graphic Strategies — Modern Publication Design

Images displayed in Figure 4.61 - Figure 4.66 are the representative examples of illustrations and photographic images, i.e. visuals employed in various types of page layouts along with the text in modern publication designs. Varied composition patterns of the image and text placement techniques in modern graphic designs are observed, documented and presented as follows:

1. Visuals which are employed in the page layouts can be categorized as photographs, hand drawn illustrations, vector illustrations, diagrams, patterns, symbols, icons, information graphics (tables and charts), typographic graphics and 3D graphics.

2. Visuals are placed in the manuscript layout page layouts for diverse reasons:
   i) Cover page designs (Figure 4.61)
   ii) Section separator (Figure 4.62)
   iii) Visuals in the opening of the chapters and in between the chapters (Figure 4.63)
   iv) Visuals between the article pages (Figure 4.64)
   v) Visuals as a background (Figure 4.65)
   vi) Infographics, such as symbols, icons, graphs, charts and table containing information (Figure 4.66)

3. **Placement of Illustrations within Page Layout** - These examples highlights the composition strategy for the visuals and text together in page layouts.

   i) The text is wrapped around the illustration, and the text follows the shape of illustration (contour) (Figure 4.67 - Part 1).
   ii) Text is wrapped around the illustration in square form (Figure 4.67 - Part 2)
   iii) Illustration has a white space around it (margin area) (Figure 4.68 - Part 3)

iv) Full bleed image which reaches up to the edges of the page (Figure 4.68 - Part 4)

v) Images are placed in line with the text, and the text is wrapped around images in square form. In this example, the images and illustrations are placed in header and footer area also (Figure 4.69 - Part 5).

vi) An image is placed within a single column area within an article (Figure 4.69 - Part 6).

vii) Multiple images are placed within an article as one image per column (Figure 4.69 - Part 7)

viii) An image is placed occupying more than one column space, e.g. two columns space (Figure 4.69 - Part 8).

ix) Images are composed of a modular grid structure (Figure 4.70 - Part 9, 10).

4. **Illustration frame details**:

- **Shape**: Illustration frames observed in the representative modern books are of two types — i) shape of the image (Figure 4.67 - Part 1); ii) rectangular shape (Figure 4.67 - Part 2).
- **Border:** Generally, the borders are avoided for visual in modern publication designs (Figure 4.67, 4.68, 4.69). Borders for illustrations are given whenever necessary e.g. comic book (Figure 4.70 Part 2)

5. Captions: Visuals within the text area always supported by captions (Figure

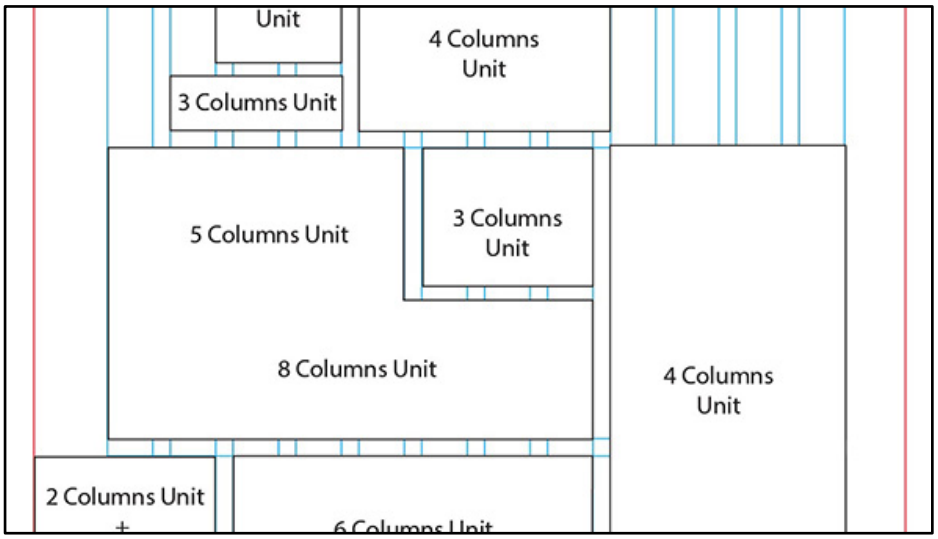


Figure 4.75: Padding around Visual in Modern Publication Design, *Sakal Saptahika*, Sakal Publishers Pvt. Ltd., 2016

6. **Padding for illustration frame** - Padding is the inner and outer white space around a visual. It can be set around any visual using digital design software. Padding space is generally equivalent to the gutter space, i.e. space between the columns. In most of the page layout, a gutter space acts as a padding space around the image as shown in Figure 4.75. Equivalent horizontal space is maintained to achieve consistency and balance in the layout. It is followed meticulously in modern publication designs through page templates.

4.2.4 (e) Comparative Analysis: Graphic Strategy in the Seventeenth Century Devanagari Brahmanical manuscripts and Modern Publication Design

Limited type of graphics and illustrations are employed very carefully if at all necessary, in the seventeenth century Devanagari Brahmanical manuscript page layouts. No extra illumination or the use of graphics such motifs or geometrical patterns have been observed in manuscript page layouts. However, various types of visuals liberally used in modern publication designs.

Similar purpose for employing Illustrations in the seventeenth century Devanagari Brahmanical manuscripts page layouts and a variety of visuals in the modern publication designs the page layouts are evidently noticed.

Application of Graphics

Graphics placed on the front and back cover page designs, section separators, within the chapter pager are very common in both the cases. In modern publication designs, the graphics are placed as background for text to create dramatic texture effect. They are also used in the section opening pages.

Organization of Space for Visuals

In the seventeenth century Devanagari manuscripts, a page is divided into modular gird structure, which creates units or modules. These modules are selected in place illustrations. This structure does not support padding space for illustrations and text. Apparently overlapping of the text on the *hasia* borders, merging of illustration borders with the beginning letters of text is noticed.

In modern publication design, the grid structure of a page consists of a modular structure made up of columns and rows with gutter space. Grid structure guides in composing visuals in multiple ways e.g. single-multiple columns, header-footer area, in-

line with the text with clear white space between other content in the page layout. This clear white space is achieved for grouping information is a gutter space between the columns and rows. It is maintained consistently in the layout to look page designs harmonious.

The observations revealed that in the seventeenth century Devanagari Brahmanical manuscripts, the illustration area is defined, based on the units or modules formed because of grid construction. The illustration areas observed for the study are mainly in the rectangular, and the precaution is taken to align them with the flow lines of the text. The illustration areas are always marked with the double line or painted border with no padding space. Interestingly, in a very few examples, the illustrations composed as section separators are full bleed images. In one of the manuscripts two full-page illustrations without margin area found inserted.

In modern publication designs, two major text wrappings patterns around visuals are noticed. In the first case, the text is found wrapped around visual, and it creates a contour shape of visual. In the second case, the text is wrapped around the visual in a square form. In both the cases, padding space is maintained between text and visual to avoid overlapping. The visuals are placed along with the text area or independently on a page within margin area or with full bleed — occupying the entire space of the page till edges.

Captions for Visuals

In modern publication designs, visuals are always supported by extra information given in captions. Separate captions for illustrations are not noticed in the page layouts of the seventeenth century Devanagari Brahmanical manuscripts.

4 .3 Theme 3: Layout Styles and Fundamentals of Page Layout Principles

Composition in page layout design is an organized arrangement of various design elements, such as text, images, graphics, etc. to make a layout. Fundamentals of design guide in making cohesive and spatial arrangements between the content used in the design. It is achieved with effective placements, alignments, division of space, grouping, visual flow, etc. The composition should be effective and functional.

4 .3.1 Aims and Objectives

To identify aesthetic elements in the composition and layout of the seventeenth century Devanagari Brahmanical manuscripts and to compare their design concepts with the modern publication designs.

The objectives to study this theme are to explore design elements employed in organizing content in page layouts of the seventeenth century Devanagari Brahmanical manuscripts. This study will explore:

Part A An Organization of Information

(1) Segments of manuscript and modern book

(2) Layout editorial styles and structure

Part B Page Layout Principles

(1) Colour

(4) Contrast, emphasis, and visual hierarchy

(5) Repetition, consistency

(6) White space

(7) Visual grouping

(8) Balance in layout

4.3.2 Approach to Study Composition and Layout Designs: Layout Styles and Fundamentals of Page Layouts Principles of Devanagari Brahmanical Manuscripts and Modern Books

Manuscripts collected from various repositories with common and uncommon layout design patterns. They are of various genres. A selective few are identified for the study. These representative manuscripts are scrutinized in the current study for testing of the hypothesis.

H_0 - 4 Manuscript designers have explored various types of editorial styles for the composition of page layouts, depending upon the type of content

H_0 -5 Manuscript designers have practiced design principles in composition of page layout

H_0 -6 Devanagari Brahmanical Manuscript designers of the seventeenth century remained unaltered by the thoughts of other contemporary design ideas and they did not adopt any other style in their design

The seventeenth century Devanagari Brahmanical manuscripts comprise possible design aspects, selected as representative samples. Further, they are compared with the modern publication designs under various heads as described in the 'Aim and Objectives'. (see Chapter 3: Research Methodology)

4.3.3 Part A Organization of Information in Manuscripts and Modern Books

4.3.3 - Part A (1a): Segments of the Seventeenth Century Devanagari Brhamnanical Manuscripts

After scrutinizing the representative manuscripts, following observations are recorded. A variety of information found in the manuscripts are categorized under various segments of Devanagari Brahmanical manuscripts. Results of the observations are presented here in Figure 4.75 and Figure 4.76.

Table 4. 9: Representative Manuscripts details — Physical Parts

Segments of Manuscript	**Manuscript Title**	**Library Details**		**Year**
		Name	**Acc. No.**	
1. Front cover page	*Kundamartanda - Suprabha Vyakhya*	Anandashram	S 21-1-18	1688AD
2. *Namokar / Mangalacharna* - Salutation to the God and teachers in the opening of text	*Vruttaratnakarah Satikah*	DC	3001	1637AD
3. Preamble / Introduction about manuscript	*Vruttaratnakarah Satikah*	DC	3001	1637AD
4. Colophon (Pushpika) - in the Beginning of manuscript	*Vruddhachanakya*	Anandashram	S 10-2-12	1694AD
5. Section separator before beginning of new section or chapter	*Shree Samarthakrut Yuddhakandachi Prat*	Samartha Vagdevata Mandir	Bad No. 255	17th Century
6. Body text with verse / canto no.	*Vruddhachanakya*	Anandashram	S 10-2-12	1694AD
7. Colophon - at the end of Section	*ShriVedaBhashya Prathamashtakam*	Anandashram	615	1684AD
8. Section separator at the end of section or chapter	*Shree Samarthakrut Yuddhakandachi Prat*	Samartha Vagdevata Mandir	Bad No. 255	17th Century
9. Colophon - at the of text	*Saptmashtakpada*	Anandashram	36	1669AD
10. Back cover page	*Kundamartanda - Suprabha Vyakhya*	Anandashram	S21-1-18	1688AD

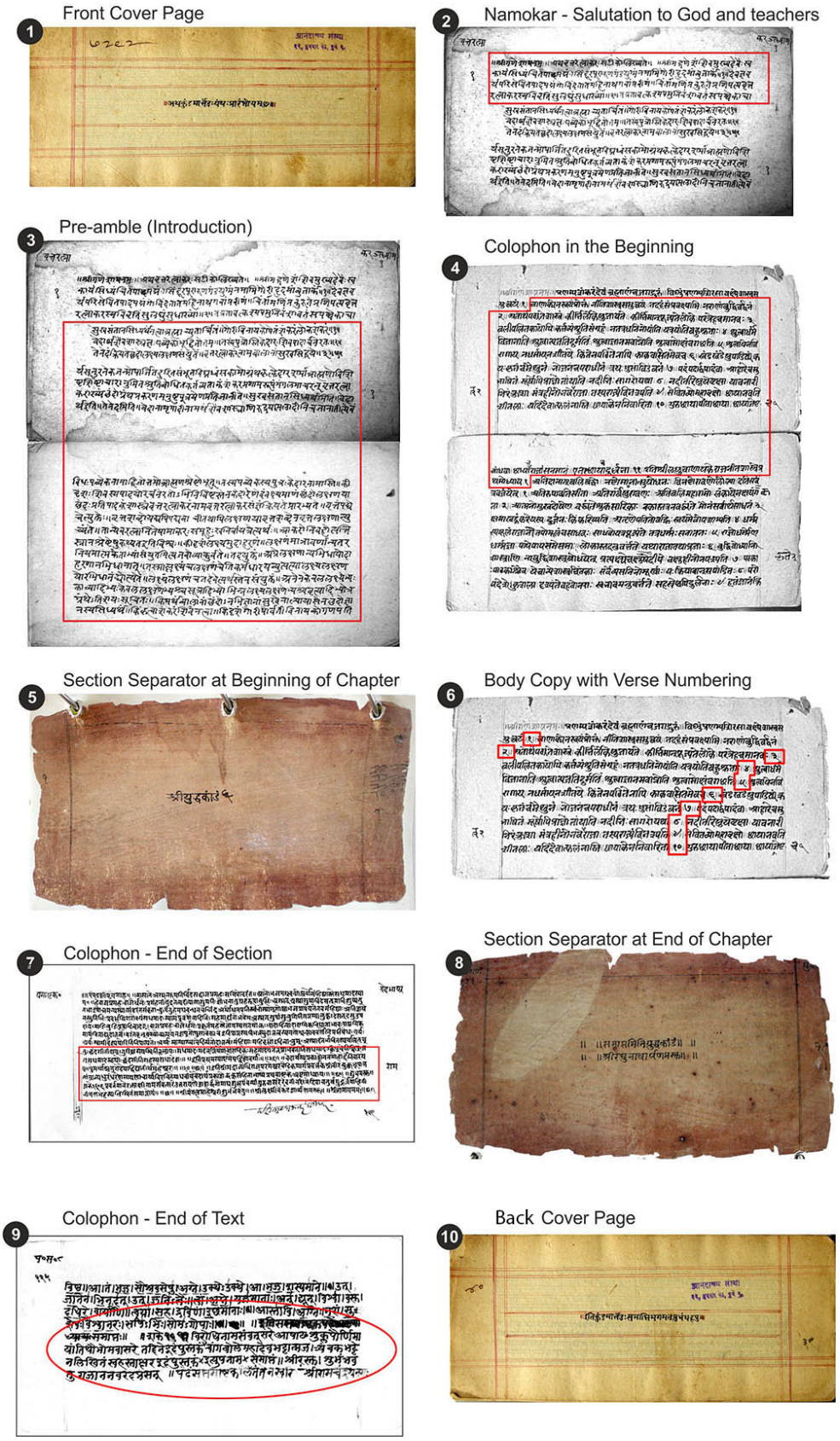


Figure 4.76: Various Possible Segments of the Seventeenth Century Devanagari Brahmanical Manuscripts

Following are the recorded observations**.** Every representative manuscript has:

a) A front cover page (Figure 4.76 - Part 1) and a back cover page (Figure 4.76 - Part 10). Cover page displays name of the text or volume and the last page i.e. back cover page reports the completion of text.

b) The common pattern noticed at the entry point of the manuscript includes '*Namokar'* or '*Mangalacharan'* i.e. salutation and honoring of the God and teachers in the opening of text (figure 4.76 - Part 2). *Mangalacharan* is the first part of any text.

c) After *Mangalacharan* or salutation to the God, most of the manuscript have an introduction written in a traditional rhetoric schematic structure i.e. *'anubandha chatushtya'*, (figure 4.76 - Part 3, 4).

d) Three types of colophon (*pushpika)* have been observed in the representative manuscripts:

   i) The first type is at the beginning of the text or volume as shown in Figure 4.76- Part 3, it describes the facts related to the subject, original writer and scribe along with their social details, and meter used for composing verses. In a very few manuscripts preamble colophon observed.

   ii) The second type of colophon found at the end of manuscript as seen in Figure 4.76- Part 9, gives description related to the title, subject, and the name of the author or original author, name of scribe, patronage, place of a manuscript written, date of completion, the reason of writing, suggestions, and remarks about safety and handling of the book, traditional blessings (*aashirvachana)*, etc.

   iii) The third type of colophon pattern found at the end of section or chapter as seen in Figure 4.76- Part 7. It begins with *'Iti'*, that means it is a final wordings of the text indicating the completion of the section. It gives facts regarding the end of chapter number, creator, details of the king, time of completion and details of scribe, etc. Last two types of colophons begin with *'Iti'* or *'Itishi'* that means 'at the end of..' as shown in Figure 4.76 - part 7 and part 9.

e) To help the reader, a page navigation system is employed on the pages of manuscripts in various ways. In few cases, section separators (Figure 4.76 - Part 5, 8) identified at the beginning and at the end of the section.

4.3.3 - Part A (1b): Segments of the Modern Books

Details of the representative modern publication selected to observe organization of information in a book

Book Title	Publisher	Publication Year	ISBN No.
Katharupa Mahabharata	Rajahansa Prakashan	2013	978-81-7434-620-9



Figure 4.77: Various Possible Segments of the Modern Publication Design

Most possible parts observed in the Modern books are as under:

1. A **'Dust Jacket'** — with the front cover, spine and back cover in 'Case binding' type, and in the paperback binding front cover page, spine, and back cover page attached to a block of pages. (Figure 4.77 - Part 1)
2. **Flyleaf —** a blank or printed page leaf, at the front and back of a 'Case Bound' book, that is the one side of the end paper is not glued to the case. (Figure 4.77 - Part 2)
3. **Half Title Page** — This page contains only title of the book and it is the first page which reader sees after opening the cover page. (Figure 4.77 - Part 3)
4. **Copyright Page** or colophon page contains information about the publisher, date, place of publication, edition, etc. (Figure 4.77 - Part 4)
5. **Dedication page** — A dedication page is a voice of author in which author names the person or people for whom he/she has written the book. (Figure 4.77 - Part 5)
6. **Full Title Page** — Repeats the title, name of the author along with publication logo. (Figure 4.77 - Part 6)
7. **Foreword** is written by the person other than the author. It can be brief information about the author and his/her work. (Figure 4.77 - Part 7)
8. A **preface** generally covers the experience of the author about the book. How the idea developed, executed, etc., and how the book came into being, or how the idea for the book was developed. (Figure 4.77 - Part 8)
9. An **acknowledgments** can be part of preface or written separately stating about the people who were helpful to the author during the time of writing.
10. The **introduction** is written by the author as a beginning section, which gives information about the purpose and goals of the writing. (Figure 4.77 - Part 9)
11. **Table of Content** is a list of chapter headings and subheading along with page numbers. (Figure 4.77 - Part 10)
12. **Section separator** works as a divider between old and new chapters. (Figure 4.77 - Part 11)
13. **Beginning of chapter** page is generally different from the others and it startss on a fresh page. (Figure 4.77 - Part 12)
14. **End of chapter** page shows some indications to the reader about the end of chapter. (Figure 4.77 - Part 13)

4.3.3 - Part A (2): Layout Editorial Styles and Structure

4.3.3 - Part A (2a): Layouts Editorial Styles — Seventeenth Century Devanagari Brahmanical Manuscripts

Observations of page layouts uncovered following page layout styles and design patterns:

Type 1: Text Based Layouts - Single Text

Type 2: Multiple Texts Layouts; Bilingual Text (Text with Commentary)

4.3.3 - Part A (2a-1) Type 1: Text Based Layout with Single Text

Four categories of single text-based editorial styles are identified in the seventeenth century Devanagari Brahmanical manuscripts. Basic classification is dependent upon the format of the page and the arrangement of the text on the page.

Details of representative manuscripts selected for the study:

Category	Manuscript Title	Physical Description
Only Text -1	*Patanjali Mahabhasya* Acc. No. 817, DC, 1653 AD	Orientation: Landscape Size of Manuscript: Width 11.3" x Height 4.5"

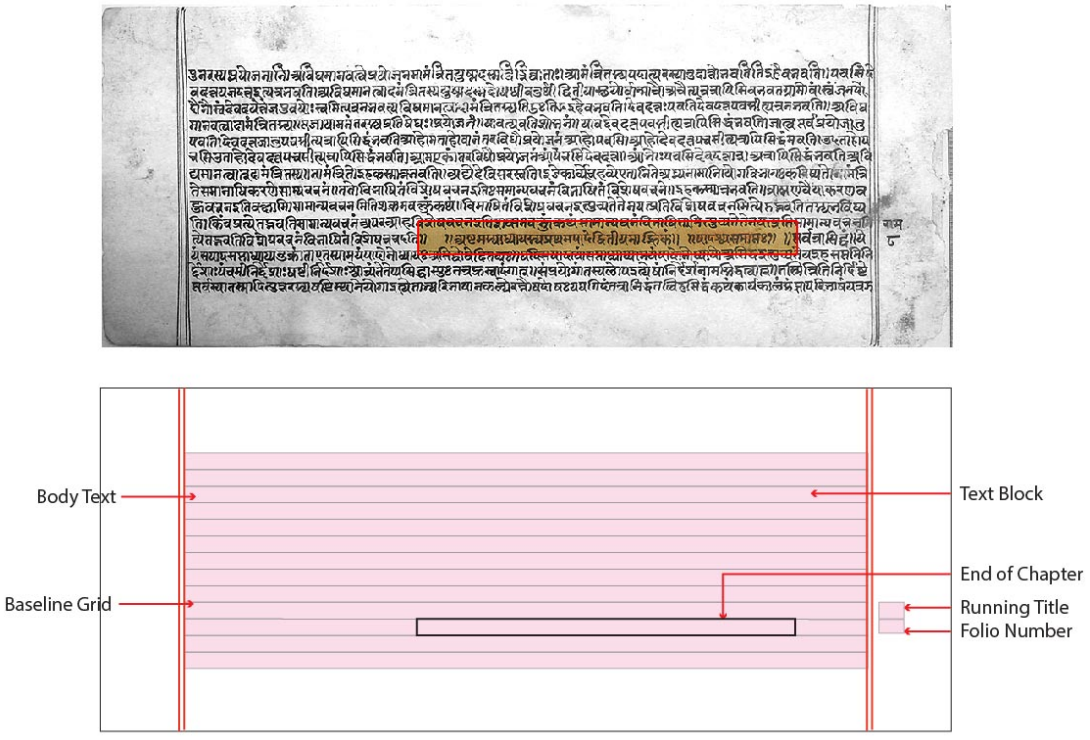


Figure 4.78: Text Based Layout with Single Text, (Category - Only Text 1), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- The text is written in a horizontal manner, continuously in the single text block.
- The distinction between the two chapters is made aware to the reader by adding a verse at the end of the chapter.(Figure 4.78) . Extra space is added before and after this verse.
- New chapter begins in the same line after previous chapter ends.
- No numbers are given to the verses within a chapter or to the chapter or section, however, chapter number is denoted linguistically.
- Consistency is maintained in the type size of the main text and at the end of chapter verse.

Category	Manuscript Title	Physical Description
Only Text - 2	*Kathakalpataru* Acc. No. 22/55, BISM, 1647 AD	Orientation: Landscape Size of Manuscript: Width 240 mm x Height 140 mm

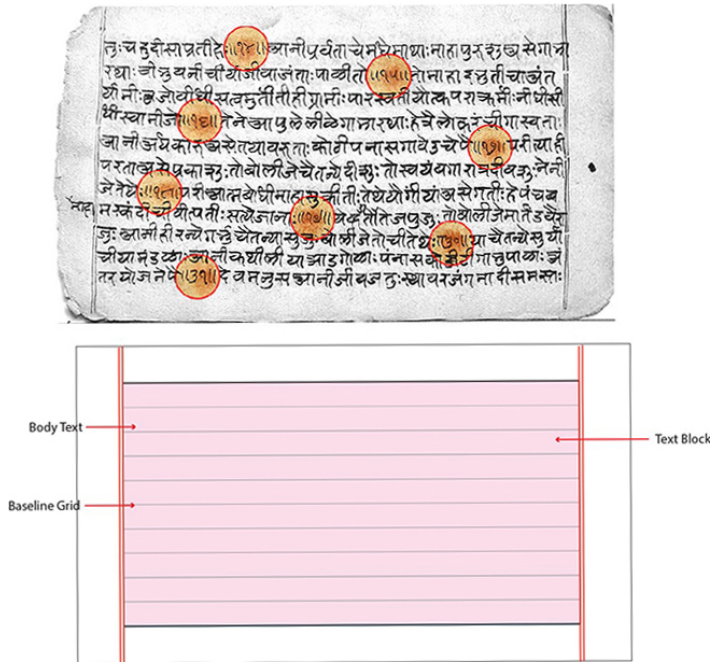


Figure 4.79: Text Based Layout with Single Text (Category - Only Text 2), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- Text is written in horizontal manner, continuously in single text block.
- Every verse has a number and it is written at the end of the verse in line with the text (Figure 4.79).
- Consistency is maintained in the type size of text.

Category	Manuscript Title	Physical Description
Only Text -3	*Shree Samarthakruta Yuddhakandachi Prata* Bad No. 255, SVM, 17th Century	Orientation: Portrait Size of Manuscript: Width $4^{1}/_{2}$" x Height 7

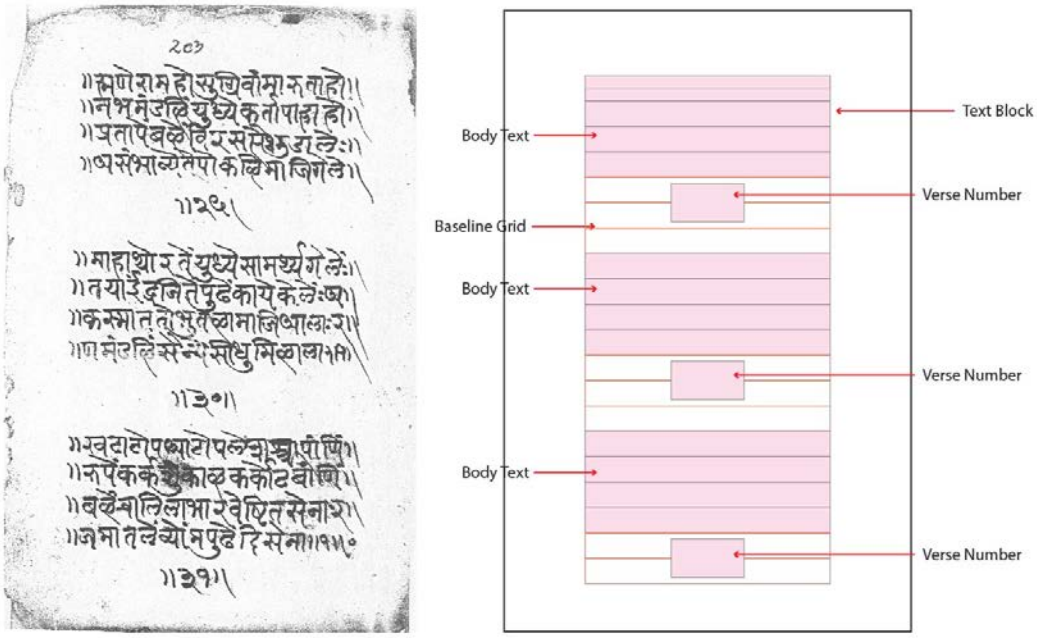


Figure 4.80: Text Based Layout with Single Text (Category - Only Text 3), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- The text is written in a horizontal manner, in modular text blocks .(Figure 4.80).
- Each modular text block comprises a stanza made of four couplets. It is composed by using Indian rhetoric system. Each stanza has total forty-eight syllables (twelve syllables per line).
- Stanza number is placed below the fourth line, in the center of fifth and sixth. One line space is left blank after every stanza number.
- No folio numbers are observed in this case.
- Consistency is maintained in the type size of the entire text.

Category	Manuscript Title	Physical Description
Only Text - 4	*Kalyanpotha* Acc. No. Bad No. 51, SVM, 17th Century	Orientation: Portrait Size of Manuscript: Width 210 mm x Height 240 mm

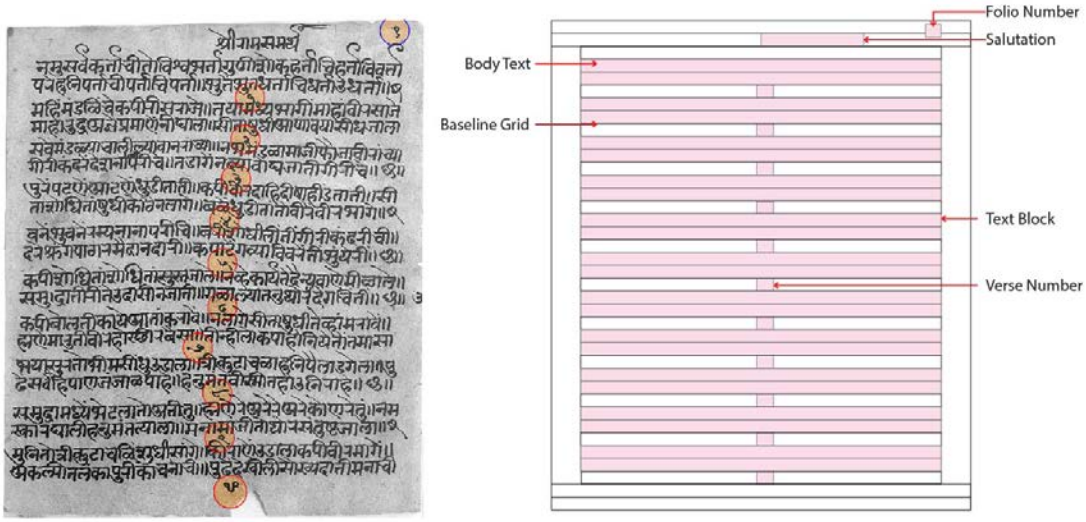


Figure 4.81: Text Based Layout with Single Text (Category - Only Text 4), Landscape Format- Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- The text is written in a horizontal manner, in modular text blocks .(Figure 4.81).
- Each modular text block comprises of two line text.
- Stanza number is placed below in the horizontal center of the second line.
- Folio number is placed in the right margin area. It is aligned to the right edge of the text block
- Consistency is maintained in the type size of the entire text.

4.3.3 - Part A (2a-2) Type 2: Multiple Texts Layouts with Bilingual Text; (Text with Commentary)

Two types of editorial styles and structures noticed. These manuscripts are bilingual and are of commentary type.

Category	Manuscript Title	Physical Description
1	*Ranganatha Virachita 'Chitsadanadalahari' Tika*, Acc. No. 39/125, BISM, 1698 AD	Orientation: Landscape Size of Manuscript: Width 11.3" x Height 4.5"

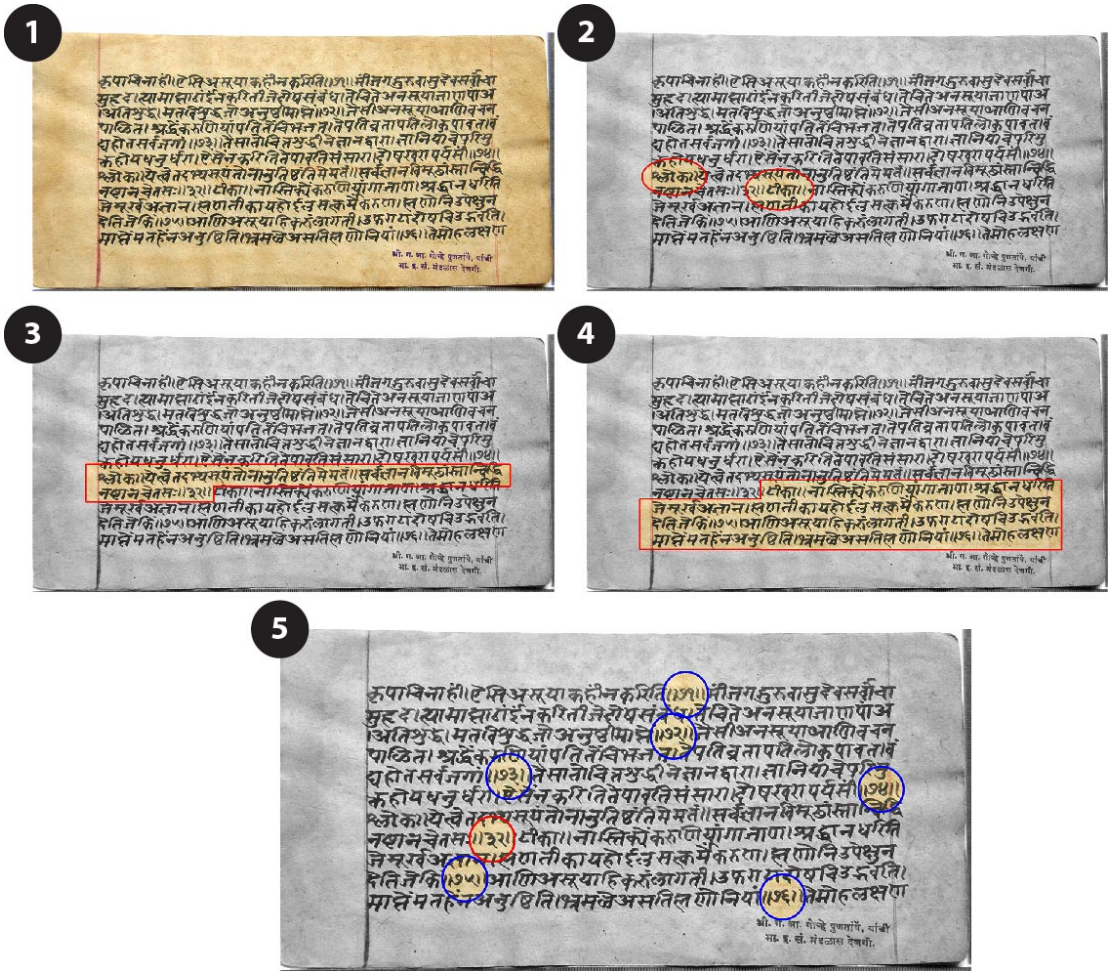


Figure 4.82: Layout Editorial Style - Bilingual Continuous Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- Main text is composed in the '*Sanskrit*' language and commentary is in the '*Marathi*' language (Figure 4.82).
- Main text and commentary are written horizontally in sequence, one after the other, as seen in Figure 4.82 - Part 1.
- The division of two distinctive kind of information is communicated to the reader by adding text e.g. '*Shloka*' in the beginning of the main text and '*Tika*' in the beginning of commentary. (Figure 4.82 - Part 2)
- The main text is highlighted with the box as demonstrated in Figure 4.82 - Part 3.
- The commentary is highlighted with the box as demonstrated in Figure 4.82 - Part 4.
- Numbers circled with blue colour are the verse numbers for the commentary, and the number circled with a red colour is the main text verse number. Numbers work as the navigation system for assisting reader.
- Consistency is maintained in the type size of the main text and the commentary.

- It shows that there are multiple verses written as a commentary and the format of number does not show any link or association with the main text. They are written in continues order.

Category	Manuscript Title	Physical Description
2	*Vrutta - Ratnakarah (Satikah)* Acc. No. 3001, DC, 1637 AD	Orientation: Landscape Size of Manuscript: Width 245 mm x Height 120 mm

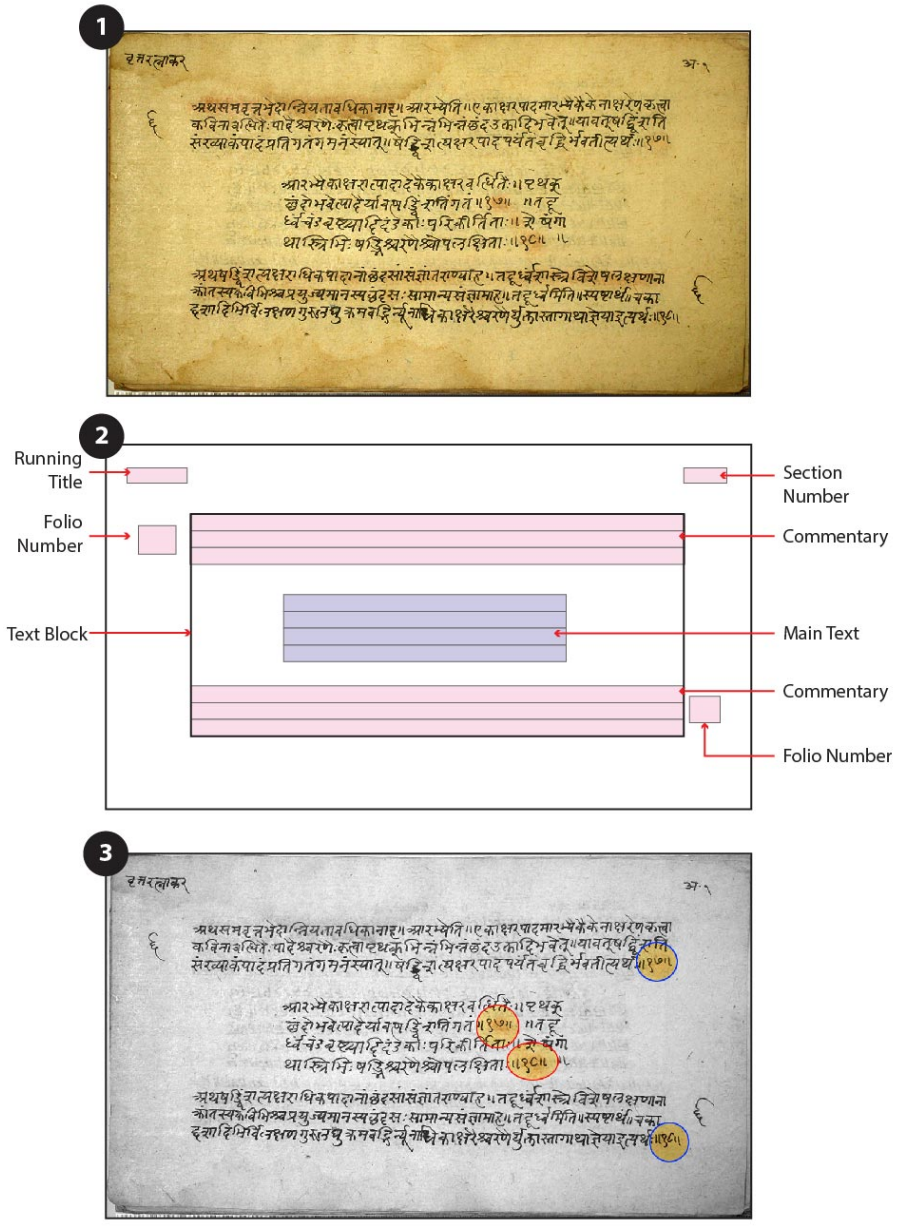


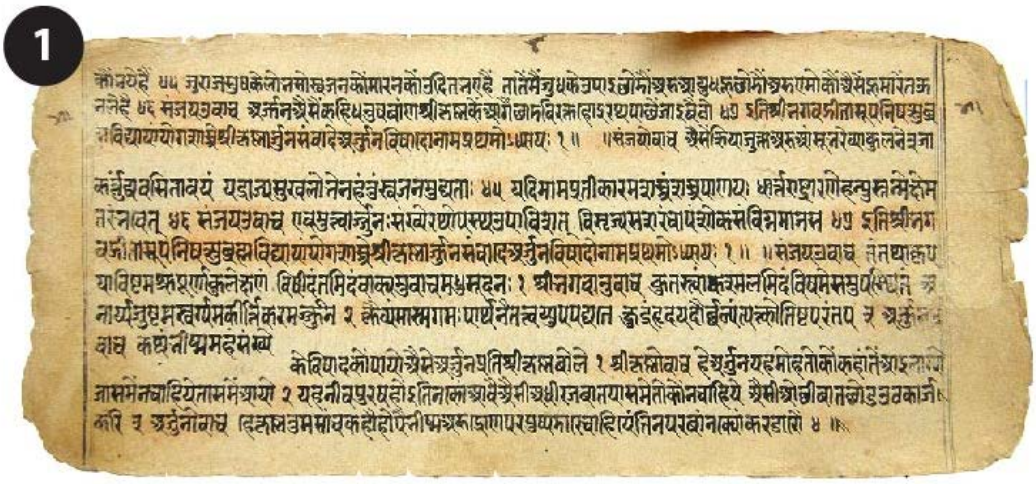
Figure 4.83: Layout Editorial Style - Commentary (*Sanskrit & Sanskrit*) *'Tripatha'* Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- The main text is composed in the '*Sanskrit*' language and the commentary is also explained in the '*Sanskrit*' language .(Figure 4.83).

- Difference between the main text and commentary is shown using the content organization strategy i.e *tripatha* style. It is explained in the earlier theme namely manuscript grid construction methods. In which three distinct horizontal division of page are created while designing a template.
- The main text area is highlighted in the Figure 4.83 Part 2. It is placed in the vertical center of the page with an extra indentation on the left and the right side than the commentary text block.
- The commentary area is highlighted in the Figure 4.83- Part 2. It placed on the top and the bottom area of the page.
- Numbers are marked with two different colours, as described in in Figure 4.83- Part 3. Numbers encircled with the red colour are verse numbers of the main text, whereas numbers encircled with the blue colour, are the verse numbers for the commentary.
- Verse numbers reveal that two verses of main text written per page. Commentary for the main text is written in couplets and in a stanza format and number is given per stanza. Unlike earlier category, in this category verse numbers for the main text and the commentary correspond with each other. It helps the reader in associating commentary with the main text.
- Consistency is maintained in the type size of the main text and the commentary.

Category	Manuscript Title	Physical Description
3	*Bhagvad Geeta - Satikah*, Acc. No. 51/73, BISM, 1696 AD	Orientation: Landscape Size of Manuscript: Width 245 mm x Height 120 mm



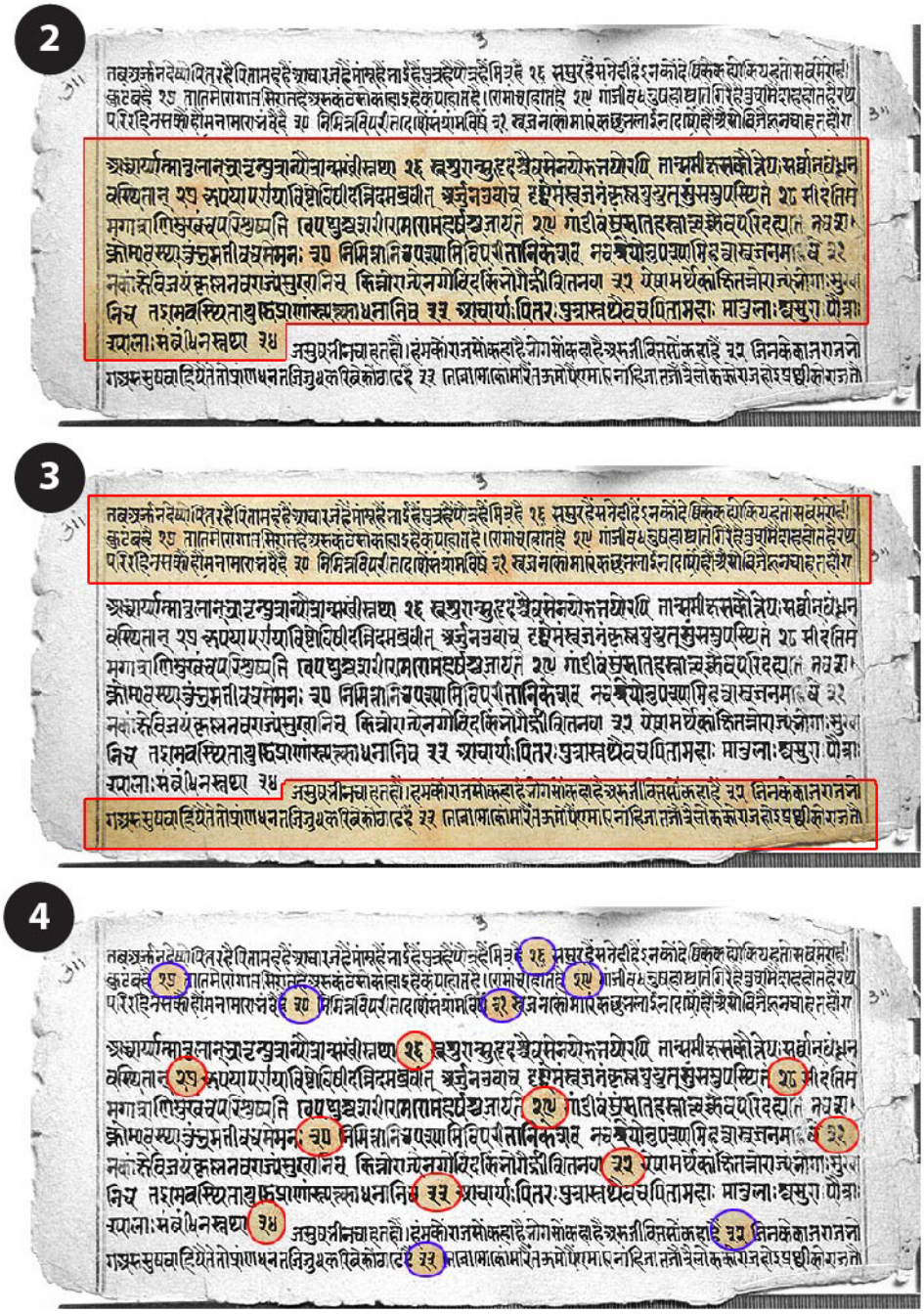


Figure 4.84: Layout Editorial Style - Bilingual (*Sanskrit & Hindi*) '*Tripatha'* Text Layouts Format, Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- Main text is composed in the '*Sanskrit'* language whereas commentary is in the '*Hindi'* language .(Figure 4.84)
- The difference between main text and commentary is shown using the content organization strategy i.e *tripatha* style. It is explained in the earlier theme - manuscript grid construction methods. In which three distinct horizontal divisions of page are created while template designing.

- The highlighted area in the Figure 4.84 - Part 2 is the main text. It is placed in the vertical center of the page with an extra indentation on the left and the right sides than the commentary text block.
- The highlighted area in the Figure 4.84 - Part 3, is the commentary and placed in top and bottom area of the page.
- Numbers are marked with two different colours, as described in in Figure 4.84 - Part 3. Numbers encircled with the red colour are verse numbers of the main text, whereas numbers encircled with the blue colour, are the verse numbers for the commentary.
- A multiple number of verses written in the main text area. For every such main text verse, one verse of commentary is written in the commentary area.
- Numbers of main text verse and commentary verse are similar.
- Main text type size is bigger than the text written in the commentary area.

4.3.3 - Part A (2b) Layouts Editorial Styles —Modern Books

In modern publication design, page layouts are designed from a single column to multiple columns depending on the complexity and the variety of content composed within it. It is explained in detail, in Theme 2 - Grid Construction Patterns in Modern Books.

There are countless layouts available in modern publication design. Only a few are chosen as a representative samples to know page layout editorial styles and the design patterns in context with the study:

Type 1: Text Based Layouts - Single Text, Multiple Text
Type 2: Multiple Texts Layouts; Bilingual Text
Type 3: Appropriation in Page Layouts

4.3.3 - Part A (b2-1) Type 1: Layouts Styles — Text Based Layout with Single Text

Category	Title of Publication	Physical Description
1	*Shree Swami Charitra Saramruta*, Shree Swami Samartha Prakashan	Orientation: Landscape Religious Book

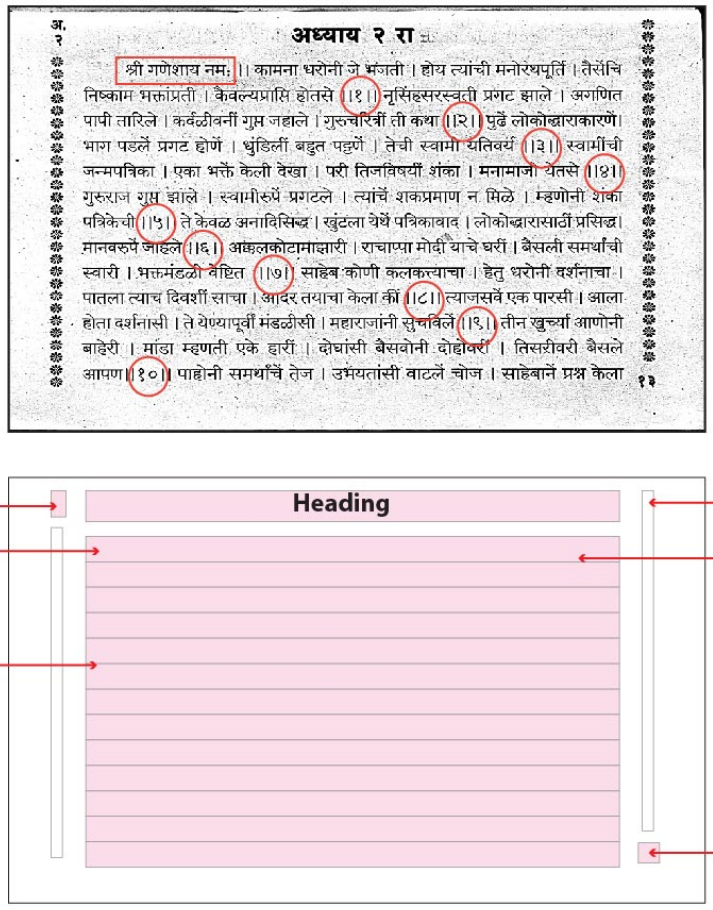


Figure 4.85: Text Based Layout with Single Text (Category - 1), Landscape Format- Modern Publication Design

Key Features

- The text is written in a horizontal manner, continuously in the single text block.
- Every new chapter begins with a new page. The title of chapter number represented in bigger type size and in bold lettering .(Figure 4.85).
- Every verse has a number and it is written at the end of the verse in line with the text.
- Consistency is maintained in the type size of the main text and at end of chapter verse.

Category	Title of Publication	Physical Description
2	*Prarthana Preeti,* Sheemad Bhagavadgeeta Paathshala, Sat Vichar Darshan Trust	Orientation: Portrait Brahmanical Religious Prayer Book

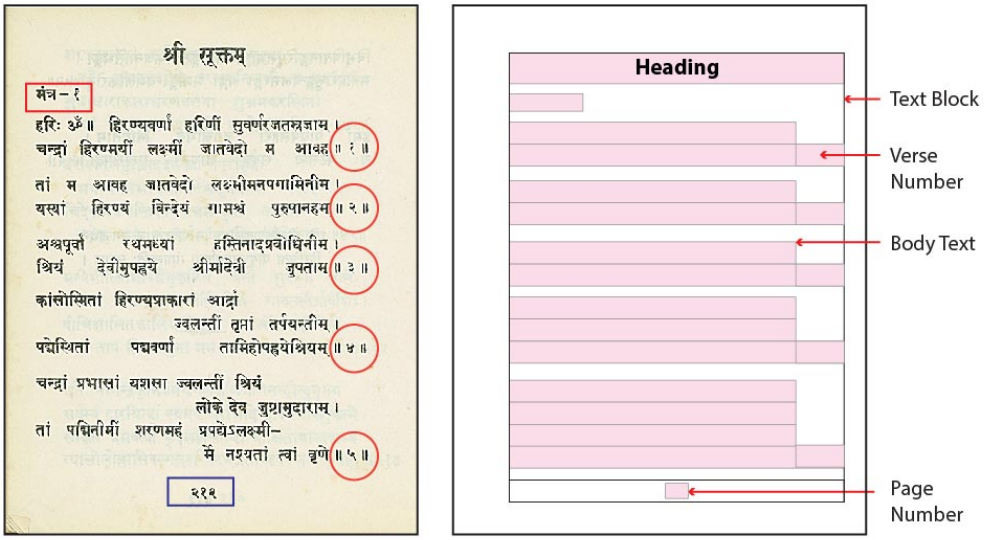


Figure 4.86: Text Based Layout with Single Text (Category - 2), Portrait Format, Modern Publication Design

Key Features

- The text is written in a horizontal manner, in modular text blocks .(Figure 4.86).
- Each modular text block comprises a stanza made of two couplets.
- Stanza number is placed at the end of the second line, in line with the text but outside text area. All stanza numbers are aligned to each other vertically.
- Page numbers are observed in this case.
- Consistency is maintained in the type size of entire body text. The heading is bigger in type size than body text and has applied bold attribute.

Category	Title of Publication	Physical Description
3	*Sakal Saptahika*	Orientation: Portrait Weekly Magazine

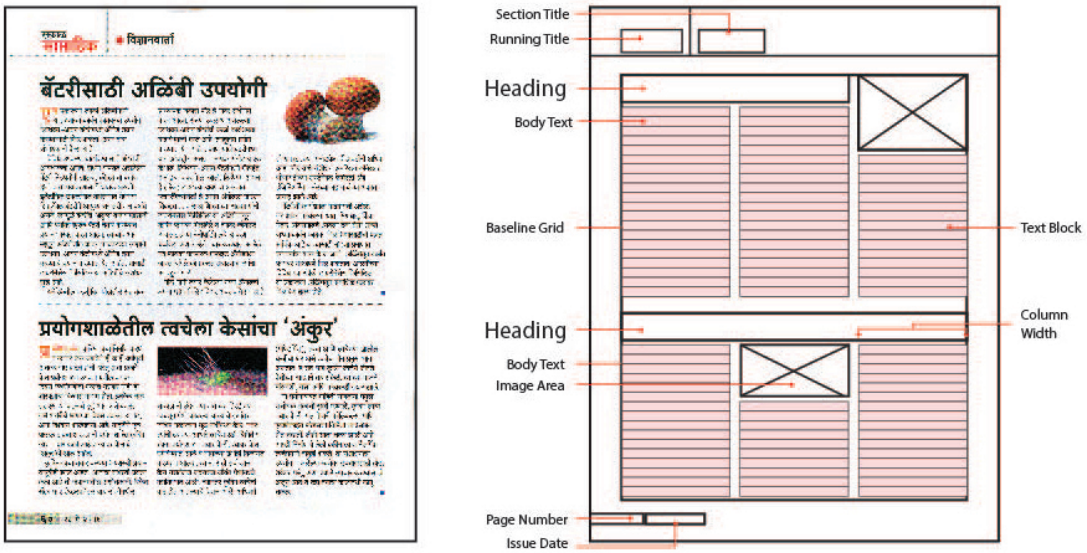


Figure 4.87: A Section - Multiple Text and Image Based Editorial Layout with Single Text (Category - 3), Portrait Format - Modern Publication Design

Key Features

- Representative page layout is one of the sections in the weekly magazine. It has two articles based on the same subject related to section .(Figure 4.87).
- A page divided into two rows to accommodate content of two articles horizontally within multiple columns.
- In each article, three distinct typestyles are applied for heading, body text and drop capital. Headings are bigger and bolder than body copy.
- An articles begin with the drop capital letter, which is bigger in size than the body text and occupies two line space. Drop capital letter has a red colour.
- Consistency is maintained in the text styles and their attributes e.g. type size, gray value, colour, the spacing between the lines, etc. in all articles of the magazine.
- Page navigation system, e.g. running title, page numbers, and issue details are placed in header and footer area**.**

4.3.4 - Part A (b2-2) Type 2: Layouts Styles - Text Based Layout with Bilingual Text

Category	Title of Publication	Physical Description
1	*Kabir*, Mauj Prakashan Gruha	Orientation: Portrait Translation of Poetry

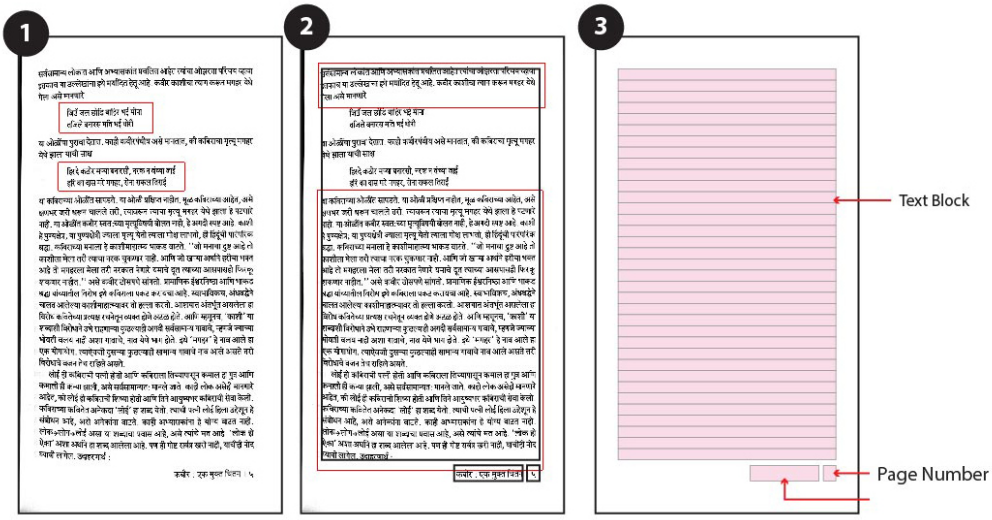


Figure 4.88: Layout Editorial Style - Bilingual (*Hindi* & *Marathi*), (Category - 1), Portrait Format - Modern Publication Design

Key Features

- Main text is composed in the '*Hindi* language and commentary is in the '*Marathi*' language .(Figure 4.88)
- Main text and commentary are written in a separate paragraph. The pattern of writing is: the main text written first and it is followed by several paragraphs of commentary in the vertical direction (Figure 4.88).
- The difference between two types of text, i.e. main text, and commentary is shown by adding extra indent (left margin space) to the main text.
- The main text is highlighted with the box as demonstrated in Figure 4.88 - Part 1.
- The commentary is highlighted with the box as demonstrated in Figure 4.88 - Part 2.
- Paragraphs related to the main text as well as commentary are not numbered
- Consistency is maintained in the type size of the main text as well as the commentary.

Category	Title of Publication	Physical Description
2	*Prarthana Preeti,* Shreemad Bhagavad Geeta Paathshala, Sat Vichar Darshan Trust	Orientation: Portrait Brahmanical Religious Prayer Book

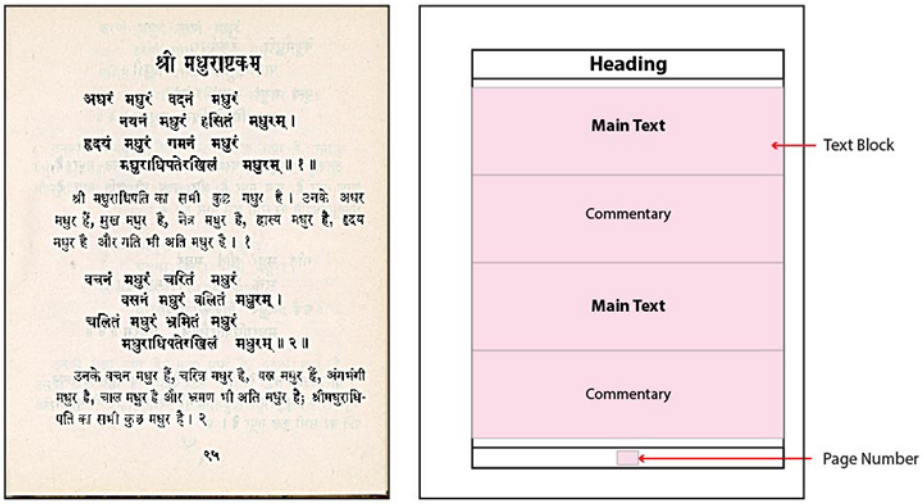


Figure 4.89: Layout Editorial Style - Bilingual (*Sanskrit* & *Hindi*), (Category - 2), Portrait Format - Modern Publication Design

Key Features

- Main text is composed in the '*Sanskrit'* language and commentary in the '*Marathi'* language (Figure 4.89)
- Main text and commentary are written in a separate paragraph. The pattern of writing is: the main text is written first and it is followed by a single paragraph of commentary in the vertical direction (Figure 4.89).
- The structure of the layout is a hierarchical grid type.
- The difference between two types of text, i.e. main text, and commentary, is shown by the difference in type size, gray value, spacing arrangement of couplets in the main text and commentary text.
- Paragraphs of main text as well as commentary are numbered. A number of main text area matches with the number of commentary area.
- Consistency is maintained in the type styles of the main text as well as the commentary in the entire document.

Category	Title of Publication	Physical Description
3	*Thaipatra*, Thai Costume Collection	Orientation: Portrait Classic Traditional Book

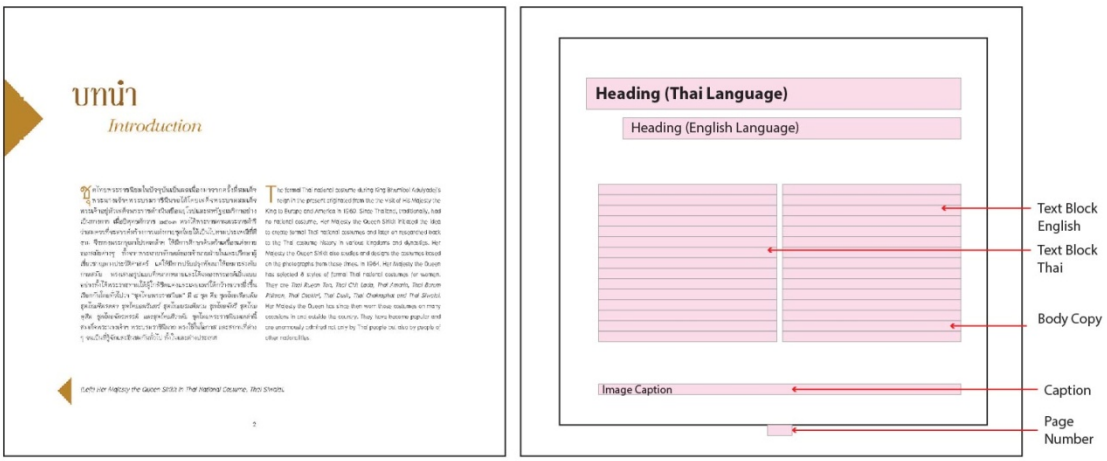


Figure 4.90: Layout Editorial Style - Bilingual (Thai & English), (Category - 3), Portrait Format - Modern Publication Design

Key Features

- Main text is composed in the 'Thai' language and the commentary is in the 'English' language (Figure 4.90).
- Page layout is designed using two column grid. In the left side column, the text placed is in the Thai language and in the right side column is a translated version of the same in the English.
- Both the Thai and the English text have same importance, and similar type of fonts are chosen for the same. Both the text blocks begin with drop capital letter with same colour. Consistency is maintained in the type styles.
- Two headings, i.e. main heading is in Thai and the other one is translated into English, shown differently. Main heading is in bigger size than the English heading however both are planned in similar colour.
- Since it is a translation, no numbering is given for paragarphs. They are placed facing to each other in separate columns.

Category	Title of Publication	Physical Description
4	*Kabir*, Mauj Prakashan Gruha	Orientation: Portrait Translation of Poetry

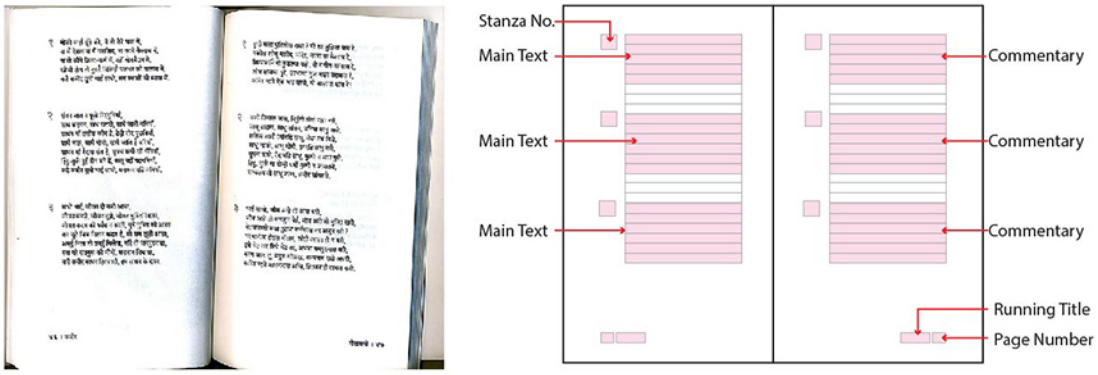


Figure 4.91: Layout Editorial Style - Bilingual (*Hindi* & *Marathi*) (Category - 4), Portrait Format - Modern Publication Design

Key Features

- The main text is composed in the '*Hindi*' language and the commentary is in the '*Marathi*' language (Figure 4.91).
- In this page layout, the page spreads are utilized in order to compose main text on the left page (verso) and commentary on right side page (recto), separately.
- The text is written in a horizontal manner, in modular text blocks.
- Each modular text block comprises a stanza made of five to six couplets.
- The stanza number is placed in the beginning are on the left side of the text block for main text as well as for commentary also.
- Apart from stanza number, a page navigation system consists of a running title, and a page number placed in the footer area.
- Consistency is maintained in the type size of the entire text.

4.3.3 - Part A (b2-3) Type 3: Layouts Styles - Appropriation in Page Layouts

Category	Title of Publication	Physical Description
1	*Ruchira*, Part 1, Mehta Publishing House	Text Based Layout
2	*CKP Khasiyat*, Rohan Prakashan	Text and Illustration
3	Continental Cooking for the Indian Kitchen	Text and Illustration
4	Saptahik Sakal, Sakal Publications Pvt.Ltd.	Text and Images

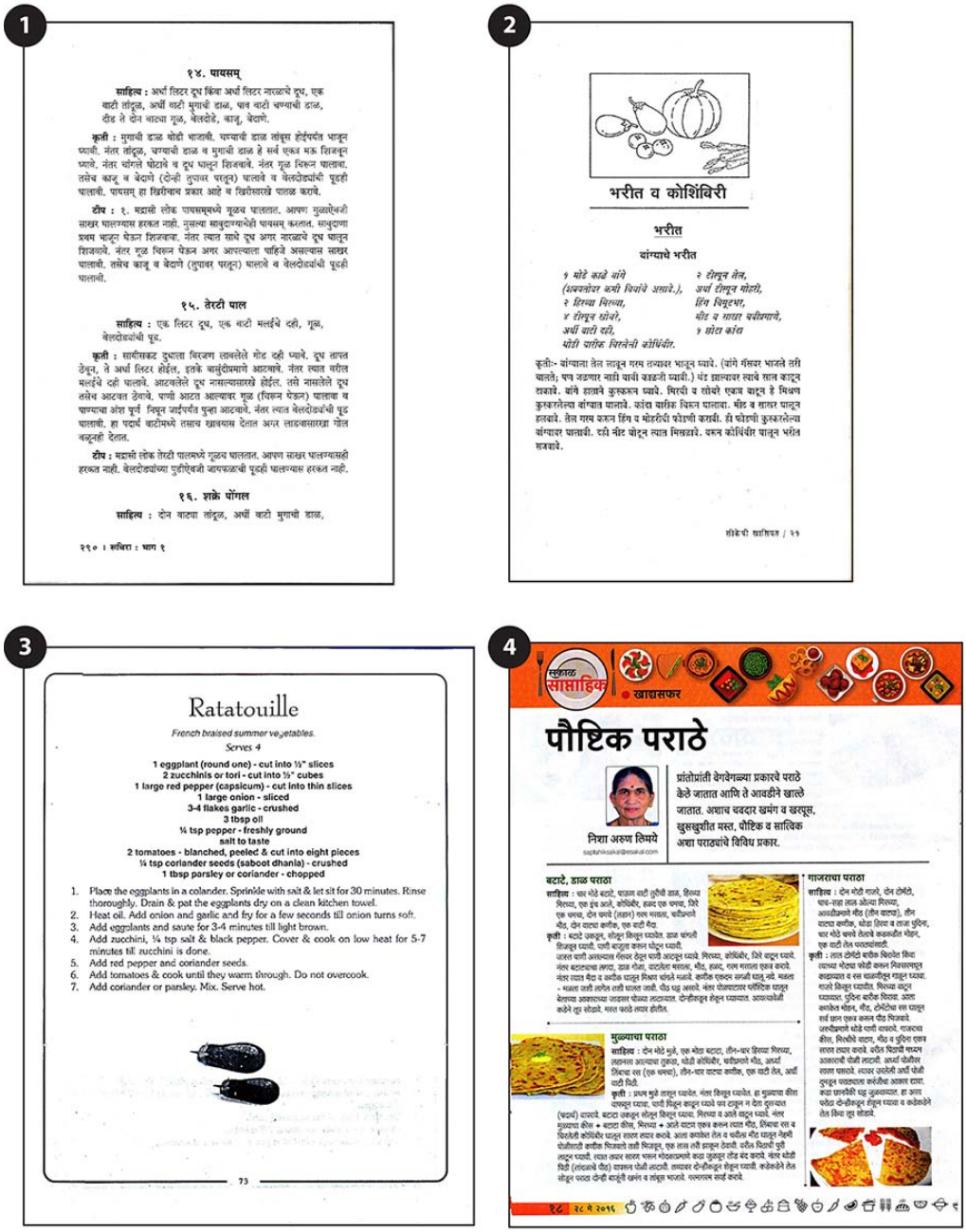


Figure 4.92: Layout Editorial Style - Appropriation in Page Layout (Type 1 to 4), Modern Publication Design

Key Features

- All specimens of Figure 4.92 (Type 1 to 4) are of similar subject.
- Appropriation in page layout that means, editorial style or structure of presenting the information follows similar format for the page layouts.
- Difference is found in the graphic strategies.
- Type 1 - page layout is text based and multiple recipes are placed on one page and they continued from one page to next page. (Figure 4.92 - Part 1)
- In Type 2 - page layout only one recipe is placed on a page along with an illustration. (Figure 4.92 - Part 2)

- In Type 3 - page layout only one recipe per page placed along with an illustration. Information do not have title but the structure of information has similarity with Type 1 example. (Figure 4.92 - Part 3)
- Type 4 page layout has multiple recipes on a single page along with colourful images and additional information, such as details of the writer. However, the structure of presenting the information is similar to other three page layouts. (Figure 4.92 - Part 4)

4.3.3 - Part A (c): Page Navigation System

4.3.3 - Part A (c1): Page Navigation System — Seventeenth Century Devanagari Brahmanical Manuscripts

Observations revealed that the two types of contents found repeated on folios of the manuscripts.

They are- 1. Running Titles, and
2. Folio Number

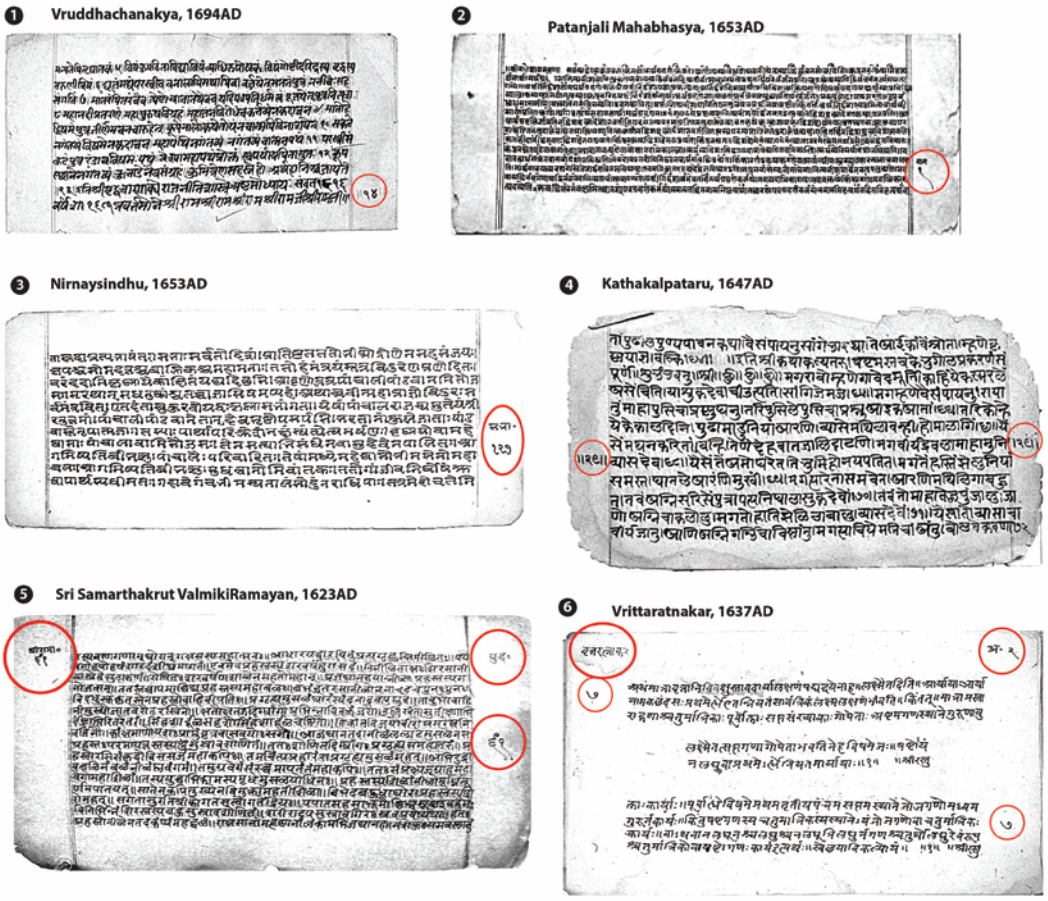


Figure 4.93: Representative Samples showing Variety in Placement of a Running Title and a Folio number, Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- Running title and folio numbers are placed mainly in the left and right margin area.
- Their position is mainly aligned to the headline grid and at various positions, e.g. top headline grid, vertical center, and bottom headline grid.
- Figure 4.93 (Part 6) shows that top margin area (header area) utilized to place full manuscript title in the left side and in the right side abbreviated section number.

4.3.3 - Part A (c2): Page Navigation System — Modern Publication Design

Observations have revealed following types of page navigation system:

1. Table of Content Page
2. Running Titles
3. Page Numbers
4. Index Pages

Following are the representative samples of the table of content pages. Following images (1, 2 & 3) demonstrates TOC pages placed in the beginning of the book, and the fourth image is an index entry type. Entries are placed at the end of the book.

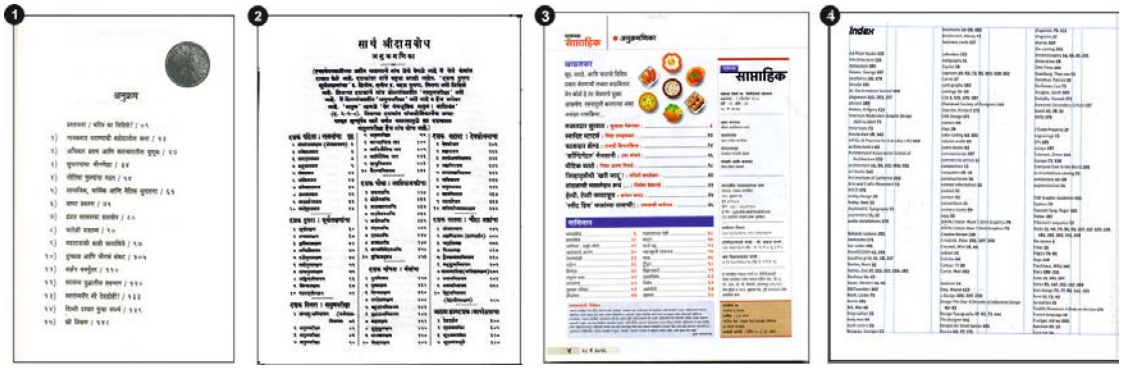


Figure 4.94: Page Navigation System - Table of Content (Part 1-3), Index Entry (Part 4), Modern Publication Designs

Following are the examples of running heads and the page numbers placed at four different locations such as header and footer area (top and bottom margins), and in the left and the right margin area.

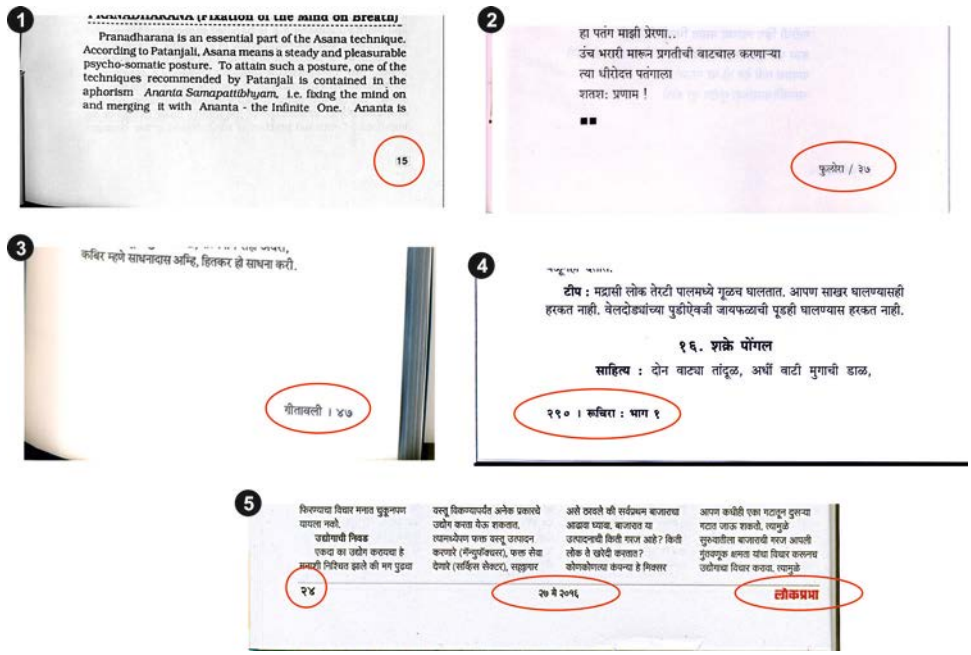


Figure 4. 95: Page Navigation System placed in the Footer Area (Bottom Margin Area), Modern Publication Designs

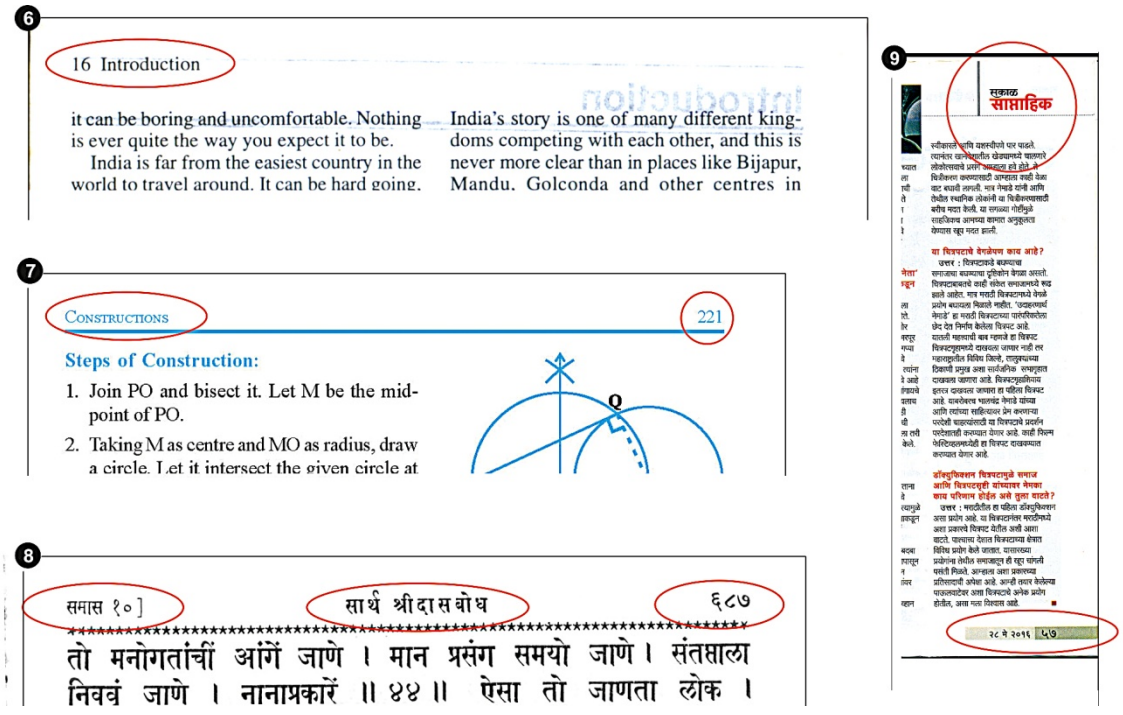


Figure 4. 96: Page Navigation System placed in the Header - Footer Area, Modern Publication Design

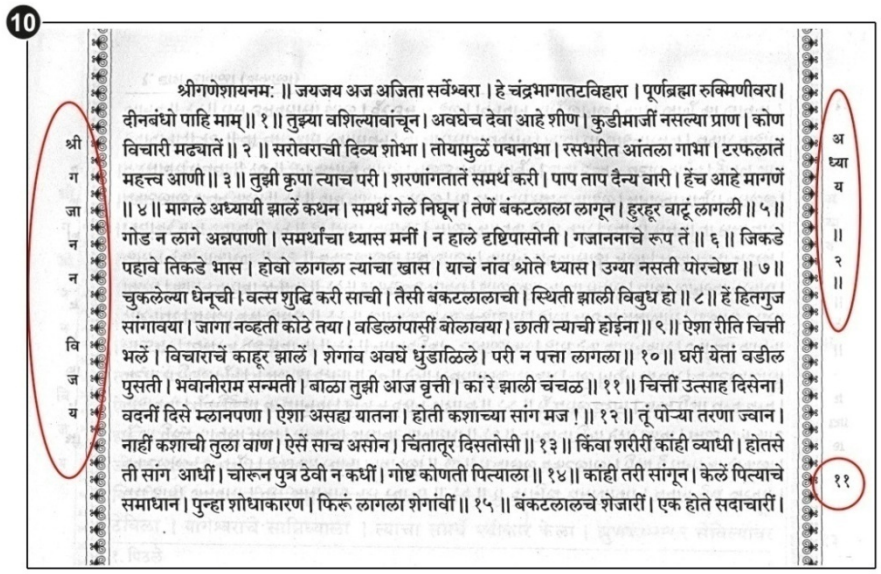


Figure 4.97: Page Navigation System placed in the Left and the Right Margin Area along with the Graphic Elements , Modern Publication Design

Key Features

- Table of content, running title, folio numbers, and index entry pages played important role in helping the reader to navigate within pages.
- Portrait page layouts - Figure 4.95 - Part 1-5, displays various placements of a page navigation content in the footer area (bottom margin).
- Portrait page layouts - Figure 4.96 - Part 6-8, displays various placements of a page navigation content in the header area (top margin).
- Portrait page layouts - Figure 4.96 - Part 9, shows placements of a page navigation content in the header and footer area both.
- Landscape page layout- Figure 4.97 - Part 10, shows placements of a page navigation content in the left and right margin area.
- Their position is mainly aligned to the page grid, text block or baseline / headline grid.

4.3.4 Part B: Page Layout Principles

Selected few representative manuscripts and modern publication designs have been studied to know page layout principles, such as visual hierarchy, contrast, colour, repetition, consistency, visual grouping, balance, rhythm and symmetry in the page layout.

4.3.4 Part B (1): Chapter Opening Pages — Entry Point

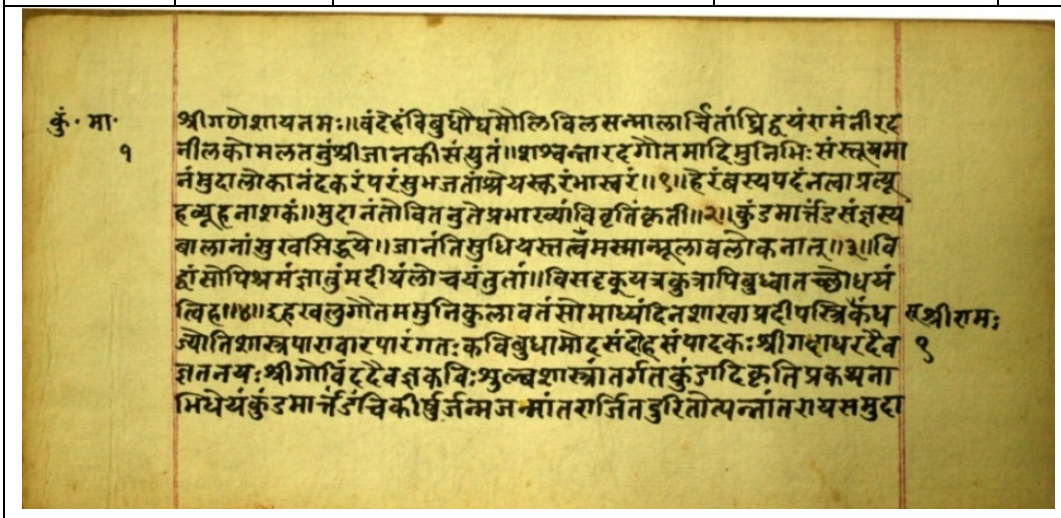
Following representative manuscripts and modern publication designs have been studied in order to understand the strategy of design for the chapter-opening page in the page layout.

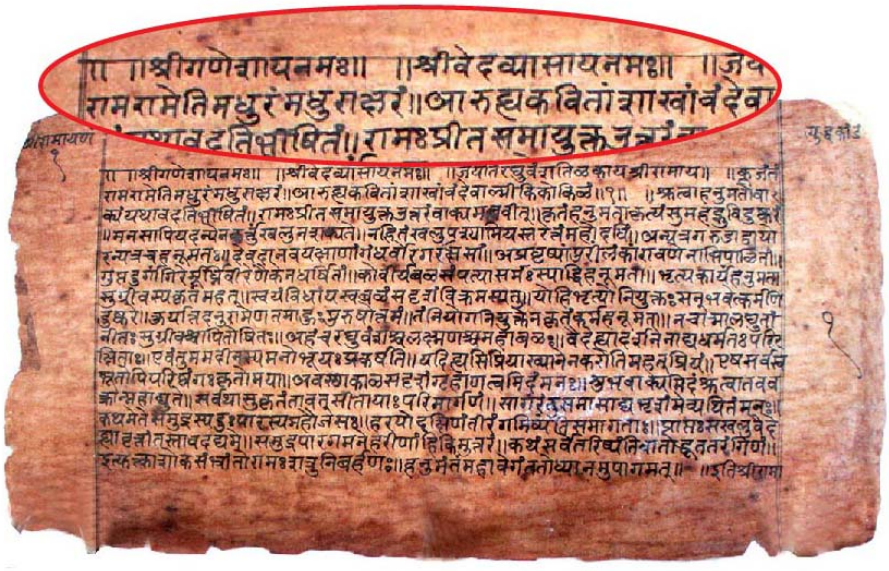
4.3.4 - Part B (1a): Chapter Opening Pages — Entry Point in the Seventeenth Century Devanagari Brahmanical Manuscripts

Three categories of chapter opening pages are evidently seen in the manuscripts.

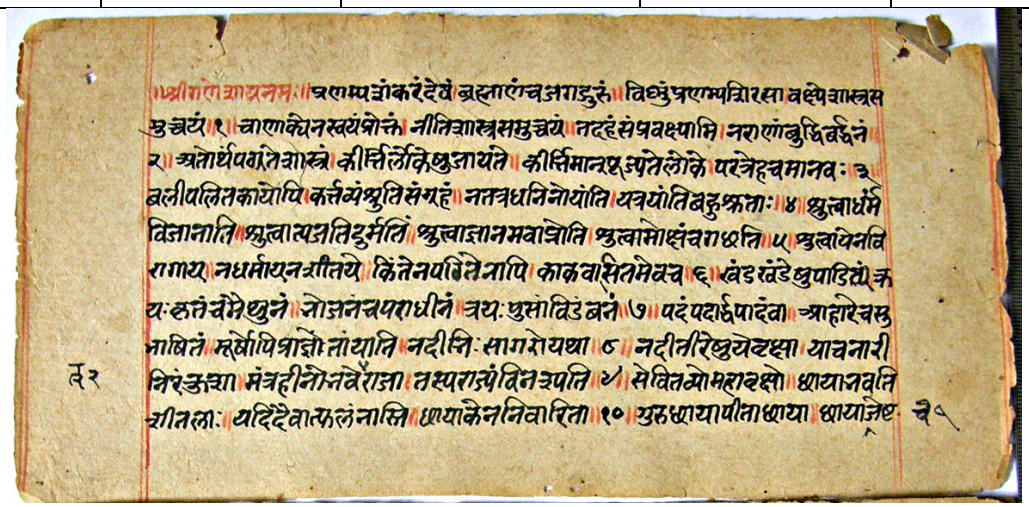
Table 4.10: Chapter Opening Patterns of the Representative Seventeenth Century Devanagari Brahmanical Manuscripts

Category	Library	Manuscript Title	Accession No.	Period
1	DC	*Kundamartandatika*	Acc. No. 10287	1691 AD
2	SVM	*Samarthakruta Ramayana*	Acc No. 746	1623 AD





Category	Library	Manuscript Title	Accession No.	Period
3	Anandashram	*Vruddhachanakya*	S 10-2-12	1694 AD



Key Features

- The majority of the manuscripts scrutinized have followed 'Category 1' type of chapter opening pages. Very few manuscripts found with the 'Category 2' type. These types of page layouts are **simple** and the content is **symmetrically balanced**.
- In all three categories, a salutation to the god is written in the beginning, at the entry point of the manuscript page.
- In 'Category 1' type of manuscripts, the text is written in the continuous horizontal manner using black colour. **Consistency** is maintained in type size and **tonal values** of text. No visual hierarchy in terms of the size between entry point and rest of the text have been observed.
- In 'Category 2' type of manuscripts extra space **(white space**) has been added either on the both sides of 'salutation to the god' or after. Thus, the manuscript designer created a visual distance or **grouping of information** by adding extra space. **Consistency** is maintained in the calligraphic style and colour of the text for 'salutation to the god' with the rest of the text. In the representative example, interest is created by adding calligraphic extensions to the folio numbers and placing them in the vertical center of the right margin. However, this page layout is also **simple** and **balanced** but it is more **vibrant** than 'Category 1.
- In 'Category 3' type of manuscripts, the red colour has been employed along with the black. Application of red **colour** for rubricating the text namely, 'salutation of god' and black colour for the main text has generated a **contrast** in the design. The use of the red colour in the punctuation mark i.e. *danda* (vertical lines) builds a trigger for the reader while associating the verses with it. It also created **emphasis** in

the text, where red colour is applied. This layout is more **dynamic** than the 'Category 2' because of **appropriate** use of colour in the design, and **colour consistency** and **continuity** are also maintained for a particular type of information.

4.3.4 - Part B (1b): Chapter Opening Pages — Entry Point in Modern Publication Designs

Representative simple to complex modern publications have been selected to study of the chapter opening pages. Modern publications selected are of various genres (Figure 4.98) such as:

Type 1 - Text based religious handbook

Type 2 - Text and illustrations based Brahmanical prayer book

Type 3 - Text and illustration based weekly magazine

Type 4 - Text and image-based publication designs

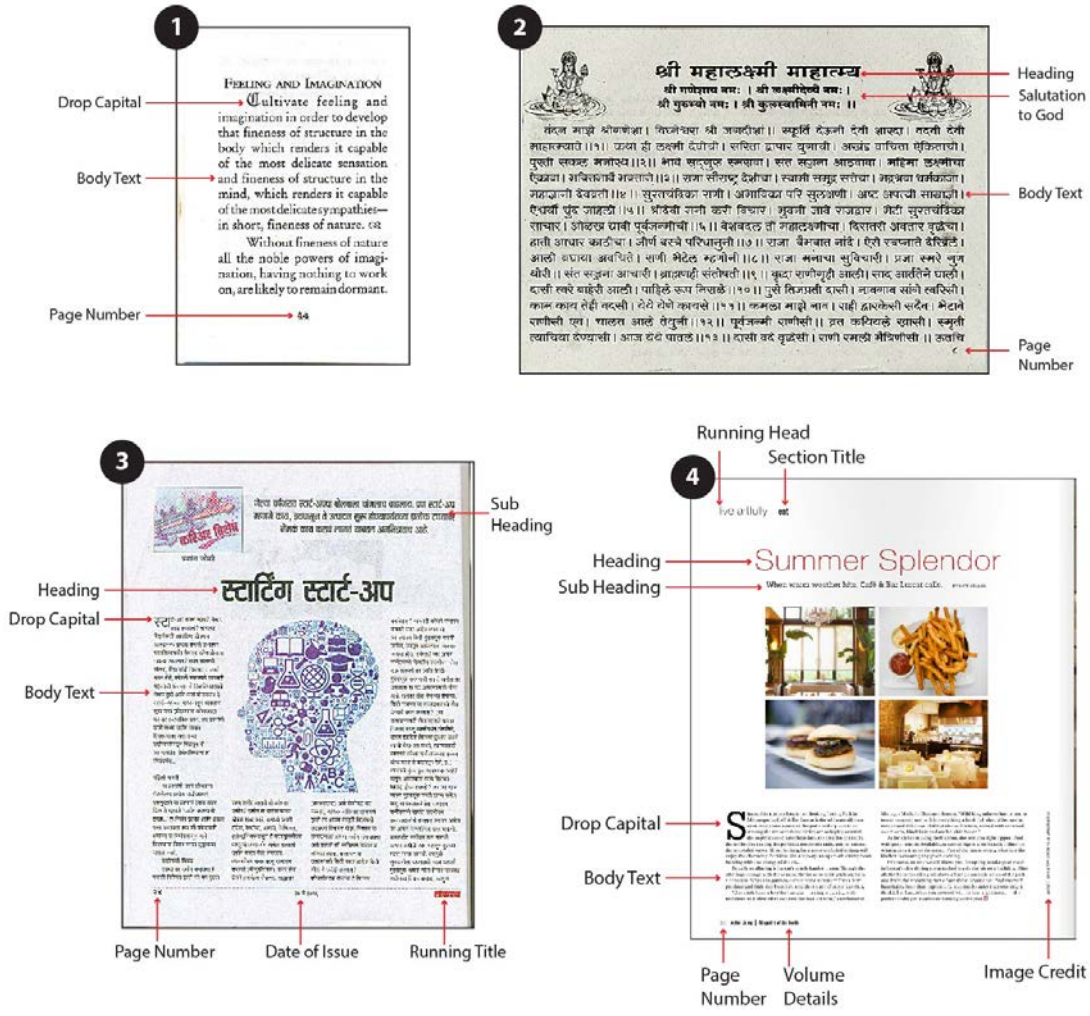


Figure 4. 98: Chapter Opening Pages - Entry Point, (Type 1-4) Simple to Complex Page Layouts, Modern Publication Designs

Common Features

- **Typographical variations** in the type style and size of heading, subheading, body copy and drop capital easily evident in the page layout. .(Figure 4.98)
- The layout shows the use of a variety of fonts, the contrast in bold and regular typefaces. The order and placement of content help reader's eye movement follow heading, drop capital and body text order. Therefore, **visual hierarchy** is achieved in the page layouts.
- **Consistency** is maintained in typefaces, size and attributes chosen for the particular style e.g. heading, body copy etc. in all the articles of the respective book.

Distinctive Key Features

- **Type 1** (Figure 4.98) page layout - content is organized to design **simple** and **balanced** layout. Interest is created in the layout by adding variety in typefaces, type styles, and their attributes. The contrast in the size of typefaces helps in adding **visual hierarchy** in the layout. Extra **white space** at the beginning of paragraphs i.e. indenting first line of a paragraph is an indicator of the new paragraph.

- **Type 2** (Figure 4.98) is the text and illustrations based Brahmanical prayer book. Page format and orientation of text shows similarity with the manuscripts. **Visual hierarchy** is shown by adding **contrast** in the size of heading, the salutation of god, and the body text.

- **Type 3** (Figure 4.98) is text and illustrations based weekly magazine. Typographical and colour variation are seen in the heading, subheading, drop capital and body text. The article begins with drop capital letter, with two-line height. **Balanced** distribution of the content resulted in a **symmetrical** page layout.

- **Type 4** (Figure 4.98) is the text and image-based publication design with image dominated chapter opening pages of articles within the magazine. **Reader's eye follows** a path in the order of image, heading, subheading, drop a capital letter and body text. Thus **visual hierarchy** created by **image dominance, white space, the contrast in size**, and **colour**. A white space in the border area effectively used in adding a **focal point** in the page layout.

4.3.4 Part B (2): Fundamental of Design and Page Layout — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Design

4.3.4 - Part B (2.1a): Colour, Contrast, Emphasis, Visual Hierarchy, Consistency, Balance, and Typography – Seventeenth Century Devanagari Brahmanical Manuscripts

Application of colour in the manuscript is examined in the context of text area only, however, the colours employed in illustrations are not considered.

Four types of manuscripts with the application of colour, identified in the representative manuscript. They are:

Type 1: Entire text is written in the black colour with no variation in text size

Type 2: Entire text is written in the black colour with variation in text size

Type 3: Text is written in two colours - black and red with no variation in text size

Type 4: Text is written in two colours - black and red with variation in text size

Type 5: Use of standardized colours, such as yellow to make corrections

Type 1 & 5 Representative manuscript shown in the following Figure 4.99. These types of manuscripts are written entirely using black colour with no variation in type size.

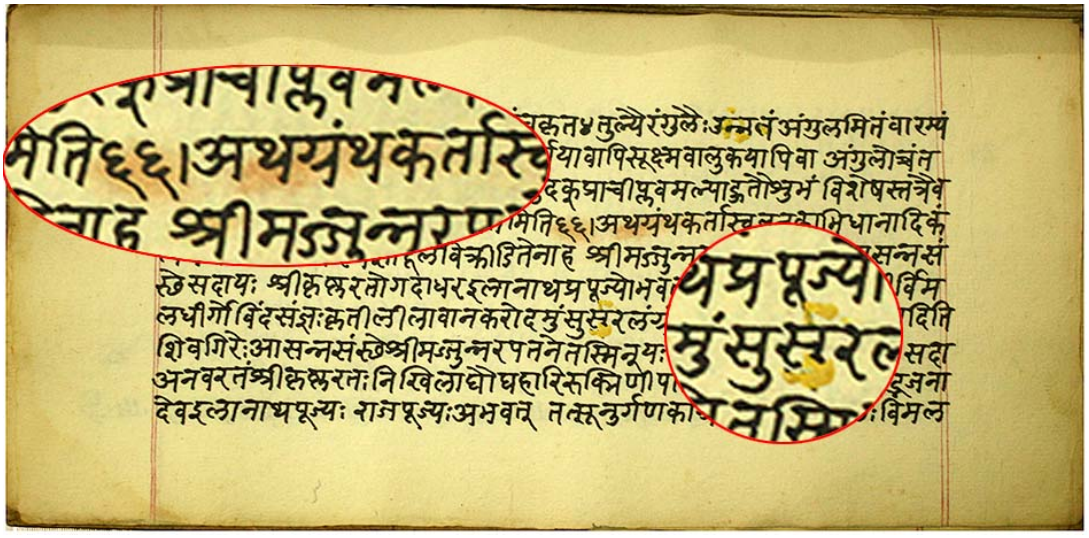


Figure 4. 99: Type 1 & 5 - Entire Text is written in Black Colour with no Variation in Type Size - Seventeenth Century Devanagari Brahmanical Manuscripts, *Kundamartanda*, DC, 1691 AD

Key Features

- In 'Type 1' group of manuscripts (Figure 4.99), the entire text is written using black colour and continuous horizontal manner. *Hasia* borders are drawn with red colour.
- **Consistency** is maintained in the **colour** of the entire text.
- **Consistency** is maintained also in the calligraphic style, type size, tonal values, and spacing between the text and the lines in the text block area.
- Although, the text is written in black colour, certain important text, e.g. verse number, end of section text, etc. is highlighted with transparent red colour. **Emphasizing** of the text by creating **contrast** in colour is deliberately done to help reader while following page navigation system.
- Yellow colour a standardized colour for deleting the unwanted text, applied at few places for making corrections.
- Static and **symmetrically balanced** page layout.

Type 2 Representative manuscripts shown in the following Figure 4.100. These types of manuscripts are written entirely using black colour with variation in type size.

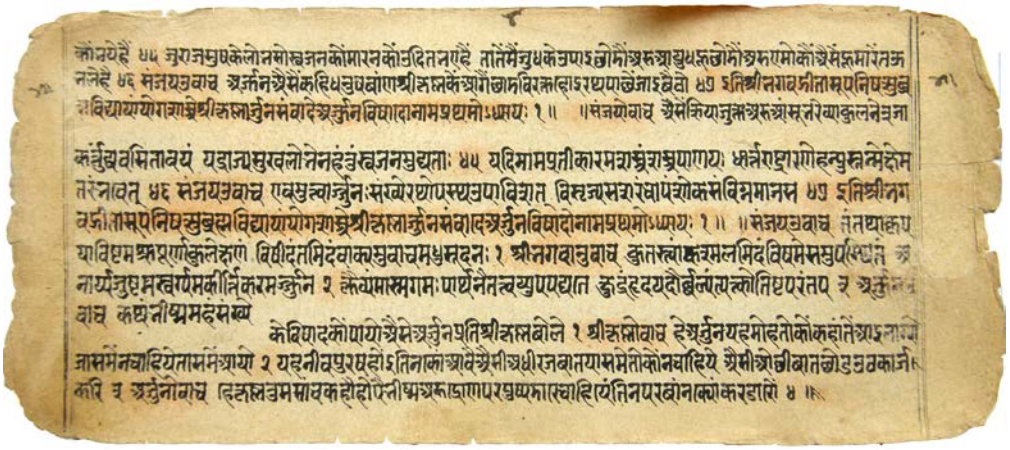


Figure 4.100: Type 2 - Entire Text written in Black Colour with Variation in Type Size – Seventeenth Century Devanagari Brahmanical Manuscripts, *Bhagvad Geeta Satikah*, BISM, 1696 AD

Key Features

- In 'Type 2' manuscripts (Figure 4.100), entire text is written using black colour and written in a continuous horizontal manner. *Hasia* borders are drawn with black colour.
- This is an example of '*Triipatha*' type of page layout, in which two types of information presented on the page: main text and commentary. The main text is

written in the bigger size than the commentary text, showing **visual hierarchy**. **Consistency** is maintained in the presentation of two types of information in the entire manuscript. Both, in the main text and the commentary **similar** style of calligraphic style, but a **difference** is noticeable in the tonal values.

- Use of variety in the **proportion** of the text sizes, enhances the **functionalilty** and the **aesthetic** value of the page layout.
- Page layout is **symmetrically balanced**. However, the adoptation of flowing drop line text alignment for commentary area in the bottom, are added a **visual movement** in the composition. As a result page layout become **assymetrical**, and **lively** in the bottom commentary area.
- Although, the text is written in black colour, certain important text, e.g. verse number, end of section text, etc. is highlighted with transparent red colour. This **emphasizing** of text by creating **contrast** in **colour** is deliberately done to help a reader while following page navigation system.

Type 3 representative manuscript is shown in following Figure 4.101. In these types of manuscripts, the text is written in two colours – black and red with no variation in text size.

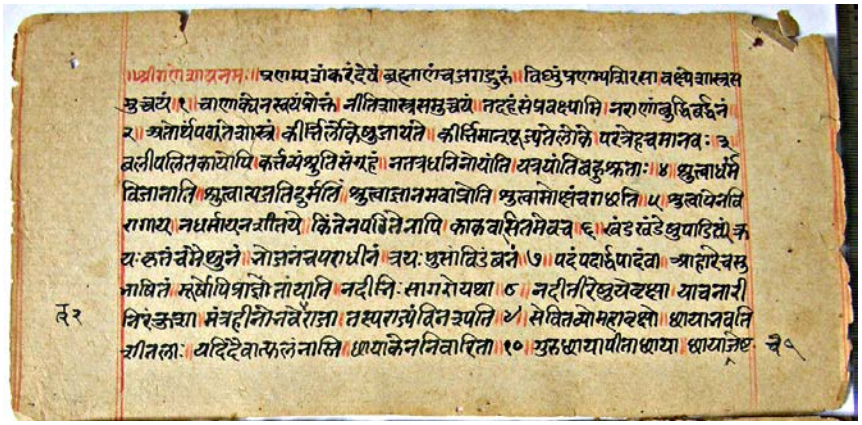


Figure 4.101: Type 3 - Text is written in two colours - black and red with variation in text size, Seventeenth Century Devanagari Brahmanical Manuscripts, *Vruddhachanakya*, Anandashram, 1694 AD

Key Features

- In 'Type 3' manuscripts (Figure 4.101), black and red colour are applied for specific type of text to indicate importance. Red colour applied to **emphasize** 'salutation to god' and for punctuation mark; whereas the body text is written in black colour. (see Table 4.10 - Category 3). *Hasia* borders are drawn with red colour.

- **Consistency** is maintained in the calligraphic style, type size, tonal values, and spacing between the text and the lines in the text block area in both colour text.
- Overall page layout is **symmetrically balanced**. However, **appropriate** use of **red colour**, made the page layout **energetic**.

Type 4 Representative manuscripts is shown in the following Figure 4.102. In these types of manuscripts, a text is written in two colours - black and red with variation in text size.



Figure 4. 102: Type 4 - Text is written in Two Colours - Black and Red color with variation in text size, Seventeenth Century Devanagari Brahmanical Manuscripts, *BhagavataPurana*, BORI, 1648 AD

Key Features

- In 'Type 4' manuscripts (Figure 4.102), two colours are employed in the text: red and black. *Hasia* borders drawn with red colour.
- This is an example of '*Triipatha*' type of page layout, in which two types of information presented on the page: main text and commentary. Design principle of **constrast in size** is applied to write main text in the bigger size than the commentary text. It also added **emphasis** on the main text and helped in showing **visual hierarchy**. **Consistency** is maintained in the presentation of two types of information in entire manucript. Both, the main text and the commentary have **similar** style of calligraphic style, but they **differ** in **tonal value** and **size.**
- Application of red colour observed in verse numbers, *danda* i.e. punctuation marks, new discourse indication, and end of section. Rest of the text is written in black colour. **Rubricated** words for the titles of new discourse indicated by creating **contrast in colour** is deliberately done to help a reader while following page navigation system and to enhance **aesthetic** value of the design.

- Use of variety in **proportion** of text sizes enhances the **functionalilty** and **aesthetic** value of the page layout.
- **Text is composed symmetrically** in the alloted space. Yet, the **overall page layout is asymmetrical** with the placed contents such as, text and illustration.

4.3.4 - Part B (2.2a): White Space, Visual Grouping, Balance in Page Layout and Typography – Seventeenth Century Devanagari Brahmanical Manuscripts

Three types of patterns are employed in the seventeenth century Devanagari Brahmanical manuscripts to distinguish one paragraph from other.

Type 1 - Addition of Extra Space between Verses - Single Text Block Format
Type 2 - Use of Unit Space between Text Blocks - Modular Text Block Format
Following manuscripts studied to understand use of white space and visual grouping.

Sr. No.	Manuscript Details	Physical Description
1	*Kundamartanda*, Anandashram, Ac. No. S 21-1-18, 1688 AD	Orientation: Landscape
2	*'Ragavibodh'*,Anandashram, Acc. No. S 23-1-3, 1616 AD	

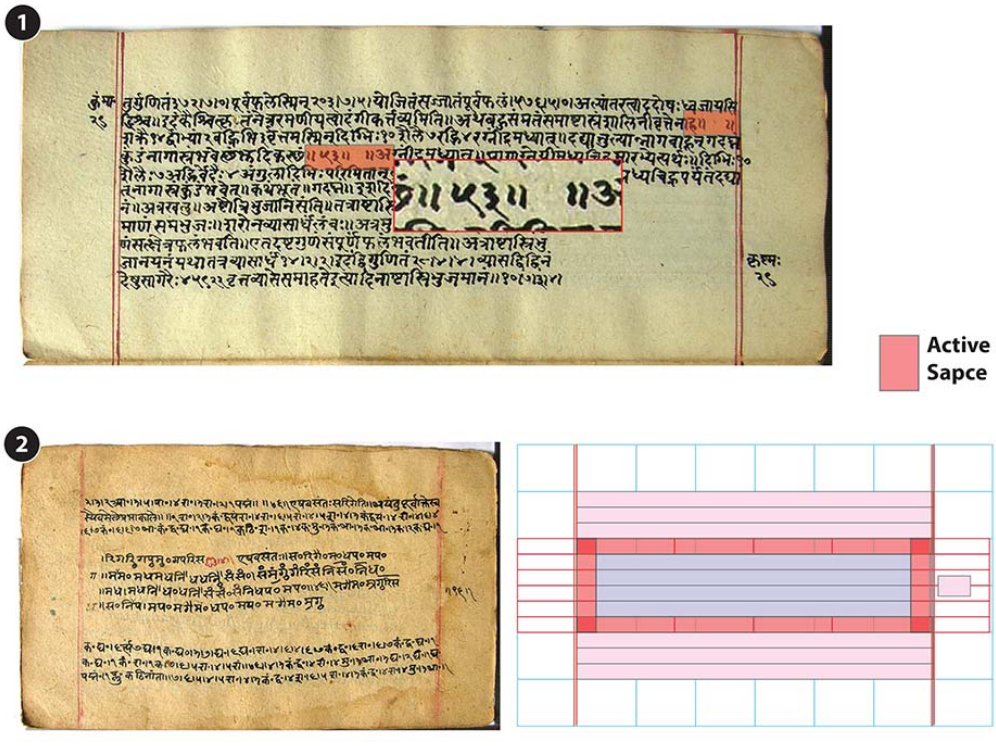


Figure 4.103: Typography and White Space (Type 1 & 2), Landscape Format Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- Figure 4.103 (Type 1) manuscript with single text block. It is the most common pattern observed in the manuscript. In this pattern the text, verses and sections are written one after the other in horizontal manner. To differentiate one section from the other, an extra space (**white space**) has been added at the end of section or before and after the verse indicating the end of chapter. This addition of **white space** has helped in producing the effect of **visual grouping of information** by separating one section from the other.
- Figure 4.103 (Type 2) manuscript is an example of modular grid structure. It has '*Tripatha*' type of page layout, in which two types of information presented on the page: main text and commentary. In the template making process, **visual groups** are formed by using more units for **white space around the main text**, which is placed in the center part of the page. More white space also help in **creating negative space around the main text** and making it the **focal point** of the layout.

Sr. No.	Manuscript Details	Physical Description
3	*Kundamartanda*, Anandashram, Ac. No. S 21-1-18, 1688 AD	Orientation: Portrait
4	*'Kalyanpotha'*, SVM, Bad No. 51, 17th Century	

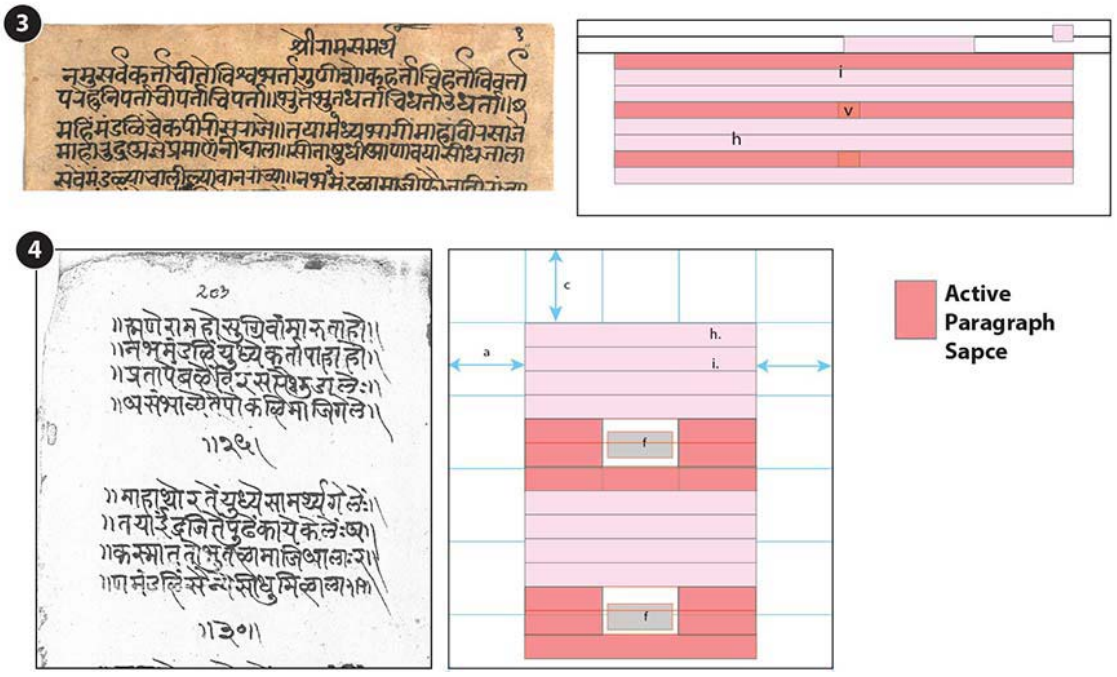


Figure 4.104: Typography and White Space (Type 3 & 4), Portrait Format Seventeenth Century Devanagari Brahmanical Manuscripts

Key Features

- In Figure 4.104 (Type 3) page layout template is created by dividing a page into headline grid. Units formed by this division of space utilized for writing text. In this example every verse is written using two units and in the third verse number is written in the horizontal center. Since, the content of the third unit is the only verse number, it helped in making rest of the entire horizontal space as **white space**. This **white space** eventually resultant in separating two verses from each other and producing the effct of **visual group formation** or **chunking of information**.
- Figure 4.104 (Type 4) is an example of page template made up of modular grid structure. **Modular units** formed by the division of space utilized for writing text. In this example every verse is written using four units, and the verse number is written in the horizontal center of the fifth and the sixth unit. The seventh unit intentionally left blank as a **white space** between two stanzas. This sequence is continued for writing next two stanzas on a page. The active white space in the fiftth, sixth and the seventh unit resulted in **visual group formation** or **chunking of information**.

Common Features

- A common feature found in every manuscript is that all manuscripts have a frame of white space in the form of defined margin areas. This space is intentionally created in page template design process.
- Arrangement of content in most of the page layouts is planned in such a way that the page should have **symmetrical** balance along the axis of page. Justified allignment of text, hasia borders, running titles along with page number on the left and right margins are placed in such a way that they do not disturb balance of the layout.
- In all the manuscripts scrutinized for the study did follow the similar design process. Their design process include: template designing, defining appropriate layout editorial style and structure, calligrphic style with the tonal value of the text, use of colour, and space management for illustrations. Once it is well set as a result this **visual unity** is maintained in all the pages of manuscripts.

4.3.4 - Part B (2.1b): Colour, Contrast, Emphasis, Visual Hierarchy, Consistency, Balance, and Typography – Modern Publication Design

Application of colour in the modern publication design is examined mainly in the text area only. Three types of modern publication designs are chosen with the application of colour. Simple to complex page layouts are selected for the study.

Type 1: Entire text is written in the black colour with variation in text size

Type 2: Text is written in two colours

Type 3: A document with multiple colours

Type 1: Representative page layouts of modern books shown in the Figure 4.104 displays text written entirely using black colour.

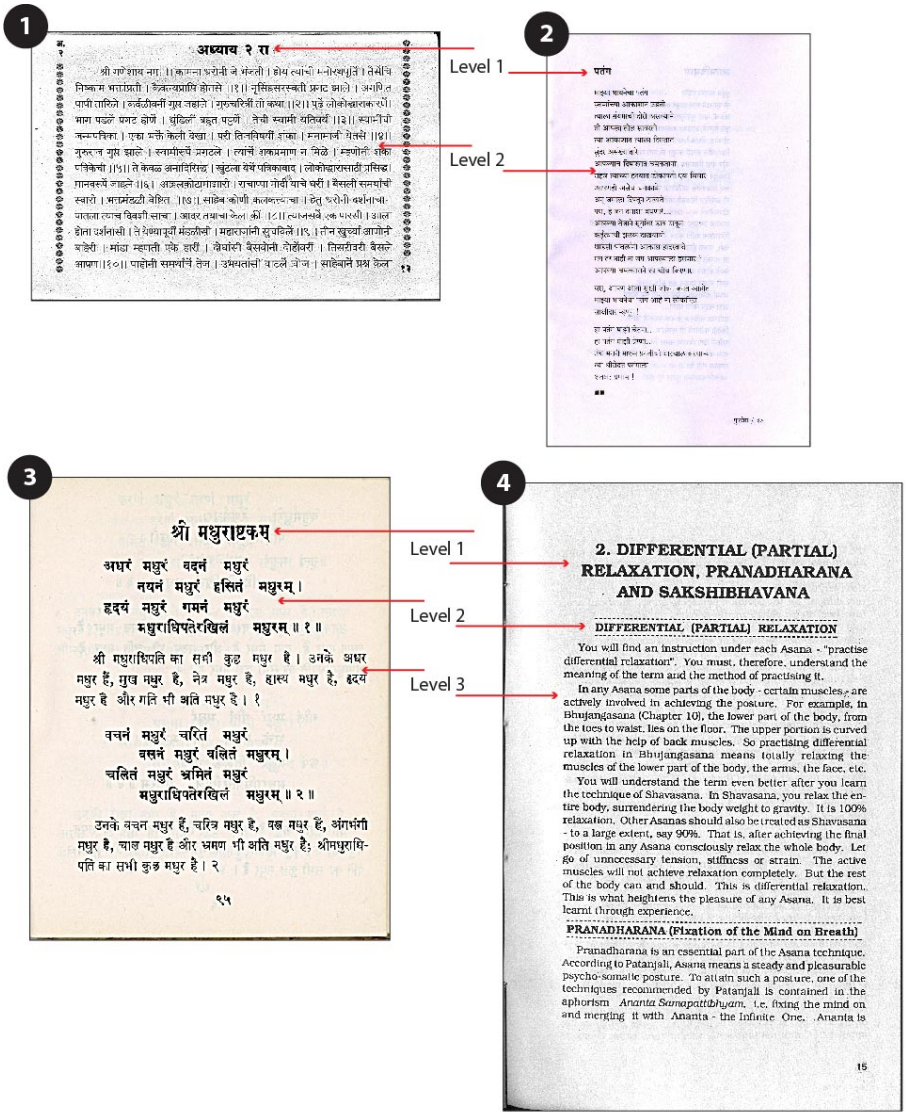


Figure 4.105: Typography, Visual Hierarchy, White Space and Single Colour (Type 1- Category 1-4)) - Modern Publication Design

Key Features

- **Type 1 - Category 1 :** (Figure 4.105) A landscape page layout format with text is composed in a single text block in horizontal manner and in black colour. Two levels of **visual hierarchy** and **contrast** in type size is noticeable. Page layout is **symmetrically balanced**.
- **Type 1 - Category 2 :** (Figure 4.105) A portrait page layout format with text composed in single text block in vertical manner and in black colour. Two levels of **visual hierarchy** and **contrast** in type size is noticeable for heading and body text. **White space** is visible in the form of extra space between two successive paragraphs. **Asymmetrical balance** is formed in the page layout, as the entire text is aligned to the left edge of the page.
- **Type 1 - Category 3 :** (Figure 4.105) A portrait page layout format with text composed in modular text blocks using hierarchial grid structure. Information is presented in vertical manner and in black colour. Three levels of **visual hierarchy** and **contrast** in type size are noticeable for heading, main text and commentary . **White space** is visible in the form of extra space between each horizontal unit. Indented space is applied in the beginning of commentary text. **Visual grouping** is formed because of hierarchical grid, white space and contrast. Zigzag arrangment of the main text is created **visual movement** in the page layout. Page layout is **symmetrically balanced** to the center of page.
- **Type 1 - Category 4 :** (Figure 4.105) A portrait page layout format with the text composed in modular text blocks using hierarchial grid structure. Information is presented in vertical manner and in black colour. Three levels of **visual hierarchy** and **contrast** in type size are noticeable for heading, sub-heading and body text. **White space** is visible in the form of indented space in the beginning of body text. A line is added above and below the sub-head to show visual grouping. Page layout is **symmetrically balanced** to the center of page.

Type 2 Representative page layouts of modern books shown in the Figure 4.106 displays text written in two colours.

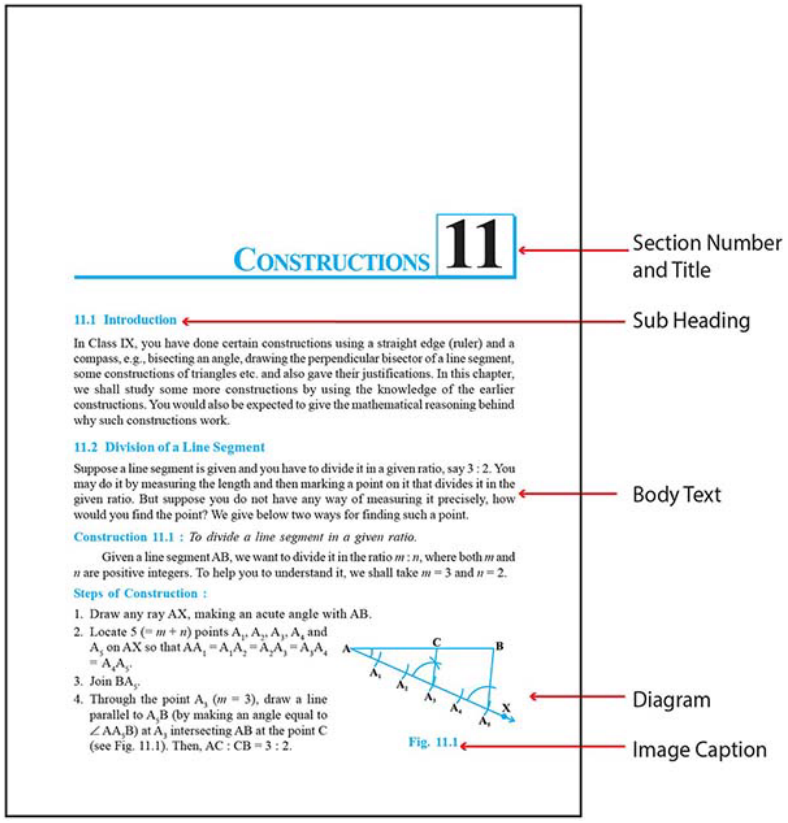


Figure 4.106: Typography, Visual Hierarchy, White Space and Two Colour Page Layouts (Type 2) - Modern Publication Design

Key Features

- In 'Type 2' page layout (Figure 4.106), text is composed of using two colours. For heading, sub-heading cyan colour is applied and for body copy black colour.
- **Visual hierarchy** and **emphasis** is shown by using design principles, such as **contrast, proportion** and **colour**. Heading is bigger than sub-heading and body text. The tonal weight of heading and sub-heading is bold whereas tonal weight of body text is normal. Heading and sub-headings are presented in different colour than the body text.
- **Consistency** is maintained in the typographic attributes throughout the book, in the heading, sub-heading and body copy
- **Blocking of white space** effect is created by pushing the heading down. This is a effective technique to compose a **focal point** in page layout with a long text.
- Overall page layout is **symmetrically balanced**. However, **appropriate** use of **cyan colour**, added interest in the page layout.

Type 3 Representative page layouts of the modern books shown in the Figure 4.107 has multiple colours employed in it. These four different section pages of same magazine.



Figure 4.107: Typography, Visual Hierarchy, White Space and Multicolor Page Layouts (Type 3) - Modern Publication Design

Key Features

- In 'Type 3' manuscripts (Figure 4.107) all four page layout differ from each other in placement of heading, number of columns, and image placement strategy. However, they follow **similar** page template for margin and page navigation system.
- **Consistency** is maintained in the typographic attributes among the level of information.
- **Visual hierarchy** is planned in the layout by using **contrast and proportion** to create **emphasis** on headings, and drop capitals
- **White space** in the page layout guide reader to look at the first images and later the text.

- Colour of heading is analogous to the images placed on the page.

- Different composition of content on each page makes page layouts symmetrical or asymmetrical. However, the entire arrangement forms **visual unity** and **harmony** in page layouts.

Common Features

- Every page layout has a frame of white space in the form of defined margin areas. This **white space** is intentionally created in the page template design process.

- Information is displayed in the page layout wiht the level of importance, e.g. heading, sub-heading and body copy. The **visual hierarchy** for the level of importance is shown using principle of design such as, **constrast and proportion**. Variations is noticed in type size, and tonal value along with addition of white space, and **elements of design** such e.g. **line**. **Consistency** is maintained in the presentation of all different types of information in entire book.

4.3.5 Findings of Theme 3: Composition and Layout Designs: Layout Styles and Fundamentals of Page Layouts Principles

4.3.5 Part A (1): Organization of Information in the Manuscripts and the Modern Books

Summary - Organization of Information in the Seventeenth Century Devanagari Brahmanical Manuscripts

- Every manuscripts has front cover page which display title of the text. In many manuscripts back cover page is also found.
- Manuscritpt begins with the salutaion of the god.
- In introduction section, the information is presented in the format of predefined rhetoric style i.e, '*anubandha chatushtya'*. This is a standardized system in which explained the type of reader of this particular text, purpose of the text, its subject, and its relation with various disciplines.
- Three types of colophon or *pushpika* are employed in the page layout. They are preamble colophon placed at the end of text and in the section beginning or end colophon. Colophon helped reader in knowing details of the author, scribe, place, date of text, rhetoric meter used for composing text, etc. Colophon placed at the begining or end of section e.g. '*Iti'* or '*Itishri'* type also guide a reader in knowing their current position in the manuscripts.
- Sections Text with various sections is organized systematically in a horizontal order in continuous manner under various segments. Two types of section separator are noticed in the representative manuscripts.

  - Within the text, denoted by the end of section text, i.e. '*iti'* or '*itishri'* with section number. An extra white space, one of the design principle is added between two section to show visual grouping or chunking of data.

  - Section title is written on a separate page. In some cases it is represented with only text or decorated with graphic borders or has full page illustration.

Summary - Organization of Information in the Modern Book Design

- Every modern book is divided into several physical segments e.g. cover page, copyright page, dedication page, full title page, foreword, preface, acknowledgment, introduction page, table of content, index page, section separator etc.
- These several segments or parts of the book are presented with specific order and have a specific function. They are generally placed on separate pages.
  - Cover page not only reveals the title of the book but also it protects the inside pages.
  - Title of book and publishers details can be seen on a full title page, half title page and copyright page.
  - Introduction page gives information about purpose and goals for writing. Dedication page, acknowledgment, foreword, and preface give information about the author, the work and the help received from the people for the work.
  - Table of Content, section separator and index pages help a reader while moving within a book as page navigation system.
- Mostly, a new sections begins with the separate page. Occasionally, as per the requiremnet of the document, dedicated section separators pages are added within the document.

4.3.5 Part A (1a):Comparative Analysis: Organization of Information in the Seventeenth Century Devanagari Brahmanical manuscripts and Modern Publication Design

While scrutinizing the representative manuscripts and comparing with modern book design, subsequently similar components are noticed:

i) Front and back cover pages

ii) Section separators for beginning and end of chapters

iii) Pre-amble (introduction)

iv) Colophon in the beginning

v) Numbering system for verses / stanzas / sections

Following dissimilarities noticed in the organization of information. They are:

Noticeable difference is observed in the seventeenth century Devanagari Brahmanical manuscripts namely the information is clubbed together in colophon includes mainly title, subject, and the name of the copier, original author, name of scribe, patronage, place of a manuscript written, date of completion, the reason of writing or copying manuscript, suggestions, and remarks about safety and handling of the book. However, this information is not elaborately presented using separate pages as seen in a modern book.

In modern books, this information is found spread across various predefined sections or parts in a specific order.

However, the pattern of information is almost similar in both, but the style of presentation is different.

4.3.5 Part A (2): Layout Editorial Styles and Structure

4.3.5 Part A (2a): Layouts Editorial Styles — Seventeenth Century Devanagari Brahmanical Manuscripts

Summary / Key Features

- Practice of predefined editorial style by defining structure, template, space management, and organization of content are evident in all the representative manuscripts selected for the study.
- Editorial style of manuscripts is based upon the page format, e.g. portrait or landscape and the type of text type, i.e.. single or bilinugual.
- Landscape Format Page - Text written in a horizontal manner within a single text block. Two types of editorial styles are employed in the manuscript page design. They are:

  Type 1 - No numbering is assigned for verses of body text. However, at the end of section, numbering is written linguistically instead of numerical figures. Extra white space is observed before and after the end of section verse. This space works as **white space** and help in **making a group of information** by separating it from other.

  Type 2 - Numbers are assigned to every verse and are written in line with the text

- Portrait Format Page - Text is written in the vertical manner within modular text block units. Numbers are assigned to the stanza and are written below the last line of stanza, mostly in the horizontal center of stanza. Extra space before or after number generates **white space between two stanzas** and hence making **visual units** or groups of text.
- **Bilingual layout** is a complex type of layout in which two type of information is presented in a single page layout. Following editorial styles observed in them.
    - The main text (m) and commentary (c) is written in 'm-c-m-c' sequence. Two examples studied to understand the editorial style.
    - The first instance revealed that, in the main text and commentary numbers do not match with each other. Main text with single verse has a number, however to explain the main text, many verses are composed in the page layout. Therefore, difference is noticed in the numbering system of the main text and the commentary. However, difference in numbering is quite confusing and there is no correlation between main text and commentary verse number.
    - In the second instance is a '*tripatha'* style page layout editorial style, in which two stanzas written on page as a main text and the commentary written in the above and below section has similar stanza number. Drop line type of paragraph alignment help in creating **visual movement** in the design.
- Numbering system works as a page navigation system. Assigning numbers for verses, stanzas and section shows the **reader friendly, utilitarian approach in manuscript system design.**
- In few layouts consistency is maintained in the typographic attributes of entire layout, e.g. type size of the main text and end of chapter verse**.** In a few manuscripts the difference in **tonal value, contrast and proportion** are noticed between two types of text information.

4.3.5 Part A (3): Comparative Analysis: Layout Editorial Styles and Structure of the Seventeenth Century Devanagari Brahmanical manuscripts and the Modern Publication Design

- Modern publication design with single text block and landscape page format (Figure 4.85) show similar editorial layout style as seen in the text based layout with single text manuscript (Category - Only Text 2 Figure 4.78). The text written in the horizontal manner with the verse number assigned at the end of in line with the text. The only difference noticed in the modern editorial style is the use of **contrast in tonal values** and **proportion in the si**ze of heading and body text to show **visual hierarchy** between the two. Provision of white space after heading helps in grouping of information.

- Modern publication design with modular text blocks and portrait page format (Figure 4.86) show similar unit based modular, editorial layout style as seen in the text based layout with single text manuscript (Figure 4.80 and 4.81). The difference is noticed in the placement of stanza number. In modern publication design, stanza numbers are aligned to the last line of stanza. Whereas in the manuscripts, they are written below the stanza.

  For a bilingual text writing, most of the modern editorial page layout formats are vertical. The main text and commentary is written using columns, hierarchical grid structure, page spreads. etc. '*Tripatha'* type editorial style, which was very much common for writing bilingual manuscripts, is not practiced currently in modern publication designs. However, its modified version is noticed with few chnages in the hierarchical grid type editorial structure, as seen in Figure 4.88- Figure 89.

- As per the tone or the rhetoric style of the layout i.e. subject of the manuscripts, a design principle i.e. **appropriation** is applied in the **page layout editorial style.** Noticeable facts show that the manuscript are incorporated with limited graphics with no extra ornamentation or decoration of the page.

- Page navigation system is observed in the seventtenth century Devanagari Brahmanical manuscripts in the form of running title, folio numbers, verse number, stanza number, section number, etc. However, in the modern publications it is observed in the most developed form e.g. table of content page, running titles, page numbers, index pages, etc. In both the case content of page navigation system is placed in the margin areas.

4.3.5 Part B : Page Layout Principles — Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Designs

4.3.5 Part B (1): Entry Point

Page entry area in the manuscripts, i.e. a 'salutation to the god', is **emphasized** in few cases, by applying rubricating effect. Rubricating is achieved by writing 'salutation to the god' in the red colour, and the rest of the text is written in the black colour. It also creates a **contrast** in colour; thus, rubricated text **seeks attention of the reader first**. However, in many cases, the chapter-opening pages in the manuscripts found stationary with no change in colour or contrast in the page entry area. (see Table 4.10)

In modern publication designs, various key elements are in practice to highlight the entry point of the new section, new article, new paragraph, etc. (Figure 4.98). To mention such practices e,g. application of drop letter i.e. making first letter of the paragraph bigger than the body (Figure 4. 98 - Type 1, 2, 3) , adding **visual hierarchy** in the heading, subheading and body text areas (Figure 4.98 - Type 1, 2, 3, 4), making heading size big and bold using attractive display type font, etc. **Indenting** paragraphs with the **extra white space** in the beginning (Figure 4. 98 - Type 1), also employed in the publications with the space crunch, e.g. newspapers.

4.3.5 Part B (2): Contrast, Proportion, Emphasis, Visual Hierarchy, and Colour

In most of the manuscripts, typographic **consistency** is maintained throughout the manuscript without variation in calligraphic style, size, colour, tonal values, spacing between the lines, etc.

- In a few manuscripts it is observed that certain important text found **emphasized** by using **contrast in colour**, (e.g. verse number, end of section text) is highlighted with transparent red colour or putting punctuation marks and verse numbers written in red. Application of red **colour** for rubricating 'salutation to the god' and black colour for main text has generated a **contrast** in the design. These techniques helped in imporving the **funcationality** and **aesthetic** aspect of the manuscript.
- Use of **colour, contrast** in tonal values not only aesthetically enhanced the page layouts of the manuscript but also made them vibrant, dynamic, yet **utility oriented**.

In modern publication designs, the information is presented in the levels using typographical variations in the type styles and the size to represent the heading, subheading, body copy and drop capital, etc. to add **visual hierarchy** in the layout. It is a very common feature of the modern publication design. Entry points of the page layouts generally have big headings, drop caps, etc.

- Use of variety in fonts, such as bold, ornamented display types for headings and readable, legible type for body text. The layout shows the use of a contrast in bold and regular typefaces. Order and placement of content help reader's eye movement follow heading, drop capital and body text order. This makes layout **dynamic**.
- **Consistency** is maintained in typefaces, size and attributes chosen for the particular style e.g. heading, body copy etc. in all the articles of the respective book.
- White space is used liberally in the modern publication designs. It is employed in between title and first paragraph of the article, indenting paragraph, between two paragraphs, etc. It helps in creating **focal point** in the page layout.
- **Constrast, white space, colour** applied for text helped in producing the effect of **visual group formation** or **chunking of information**.
- Colour harmonies are applied among a variety contents of the publication. Selection of colour in individual page sometimes compliments with the images placed within it.

4.3.5 Part B (3): White Space

Content analysis of use of white space in the seventeenth century Devanagari Brahmanical manuscripts indicates that it is used very much actively. It is used basically to show the difference between two types of information or as 'chunking of information' or visual grouping.

The concept of active space is employed in almost all the manuscripts with variation, as discussed below:

- In every manuscript a frame of white space i.e margin area is found around the text block. White space is also obvered in the entry point area, active space is noticed, which is added before and after or only after 'salutation to the God' to show **visual grouping** or the difference between entry point and rest of the text.

- Between two section, at the end of section or canto, end of verse, and in some layout styles such as *tripatha*, white space has been planned in template design, and applied in the form of units.

In modern book designs, white space is used liberally. It is employed in the margins, between title and first paragraph of the article, by indenting first line of the paragraphs. White space is also employed between paragraphs, two successive lines (leading), words, columns (gutter space), padding for images, for blocking title, etc.

However, white space is used by the seventeenth century Devanagari Brahmanical manuscript designers effectively and actively with the limited resources and budgets.

4.3.5 Part B (4): Balance in the Page Layout

In the manuscripts, page layouts making process that involved template making, *hasia* borders, space organization for main text along with the page navigation system was planned in such a way that in the page layouts that produced finally looked **simple** and **symmetrically balanced**. Justified text alignment is also a major factor; because of it page layouts looked symmetrically balance.

In representative modern publication page layouts with **symmetrical or asymmetrical** balance is noted. It was formed because of the distribution of content along the axis of the page and their respective alignment. However, the entire arrangement of the content includes following the fundamental of designs and application of colour, made it cohesive to form visual unity and harmony in page layout.

Chapter 5

Discussion and Conclusions

This chapter summarizes the thesis, discusses its findings and contributions. It also points out the limitations of the current study, and finally it outlines directions for the future research. The chapter is divided into seven sections. Section 5.1 discusses the correlation with previous research. Section 5.2 is a summary of research and discussion, and followed by the findings. Section 5.3 is a discussion on limitations of the current study. Section 5.4 is discussion on the implications of the findings. Section 5.5 proposed a few recommendations for the future scope of work. Section 5.6 converse the outline of contributions in the field of Indian manuscriptology. Section 5.7 are autobiographical reflections of the work, and finally the section 5.8 brings out the final conclusion.

This study was intended to find out the design aspects employed in the handwritten seventeenth century Devanagari Brahmanical manuscripts. The focus of the research was in the area of layout and composition design, and schematic structure of page layouts. It also highlights traditional Indian concepts of aesthetics and functionality while producing Devanagari Brahmanical manuscripts prior to the printing technology.

This thesis had the aim of exploring the seventeenth century Devanagari Brahmanical manuscripts accessible in Maharashtra in the following areas:

- To investigate distinctive systems, styles, and patterns in manuscript designs
- To identify the reason for following the minimalistic and simplistic approaches to design
- To discover the practices of various editorial styles as per the requirement of content
- To uncover the design principles employed in it
- To explore influence of other cultural designs on it

5.1 Correlation with the Previous Research

The review of literature revealed that most of the literature available for the study of manuscripts in India covered area such as manuscript collection centers, cataloging methods, traditional and modern methods of preservation and conservation of manuscripts, microfilming, computerization, historical background of manuscripts, materials and tools used for writing, textual criticism, and paleographic studies.

The literary evidence of two words '*Rachana'* and '*Kalpa'*, which are introduced in the Vedic literature *'Brahma Sutras'* and the '*Rigveda '* do support that since ancient times Indians were aware of the concept of systematic, organized order of construction as well as composition i.e. process of design.

The review demonstrated overall design trends of the manuscripts forms depending upon their sizes and the use e.g. *Kacchapi, Musti, Chedapati, Gutka, Pustika, Panavali.* etc.

The literature review indicates traditional Indian structure known as *'anubandha chatushtaya'* applied in the text composition along with various rhetorical meters e.g. *Gayatri*, *Anushtupa*, etc. Indian manuscripts designers followed a writing structure that includes various parts of the manuscript e.g. preamble, chapters, and colophon, etc. Colophon gives detail information regarding the name of the author, scribe, period, reason of writing manuscript, dynasty, dedication, laudation, etc. Various types of *pushpika* or colophon were found to have in use to inform the readers at the closing part of the canto, chapters and of the text.

One of the greatest distinctions between the Roman and the Devanagari scripts is that while drawing the grid for writing the text, in the case of Roman script, baseline grid is used whereas headline grid is practiced in the Devanagari script. Various types of tools were available to design manuscripts. Use of '*Rekhapati'* is a clear evidence for the use of a tool to draw headline grid for writing text in a systematic way. The text is written using independent letter and there were no words.

Literature written during the seventeenth century specifies the rules of writing. It suggests that a scribe should write text in a symmetrical, equal, compact and well-defined manner with suitable measurement. A practical approach is represented by

suggesting writing in straight line with proper spacing between each letter to avoid overlapping and reading letters easily.

In palm leaf manuscripts, the text area is usually divided into two to three columns. However, the text continuity is seen horizontally in the same line. The most recent study suggests that the Indian practice grid in the socio- religion related art, e.g. in *rangoli* patterns to show hierarchy among various visual elements.

A review further indicates that three types of page composition styles were followed for manuscript layouts. They are: (i) simple text, (ii) combining more than two documents together and, (iii) composite text along with different editorial styles such as *tripatha*, *panchapatha*, *mula* (main text) followed by text, etc.

The literature review also explored that the manuscripts comprised of structure e.g. margins, headline grids, and navigation system i.e. abbreviated or full running title, section number or heading, page no. etc. in marginalia.

These findings are broadly in tune with those of previous researches, such as the standardization and codification of colour. The black ink was used for writing *pothi* or manuscript, whereas red ink used in the margin border and for the decoration purpose. Red ink was also used for rubricating text, punctuation marks (*danda*) , salutation text, verse number, colophon, end of the stanza, end of canto / chapter, etc.; yellow ink to show corrections and deletion; gold and silver to draw borders and decorative work.

These findings are consistent with previous research. The text content is seen supported by diagrams in the manuscripts related to mathematics, astronomy, etc. Tripathi observed that although in paper manuscripts perforations did not found place because of fragile nature; the place was kept either empty or decorated in Jaina manuscripts, and it is not found in any of the Brahmanical manuscripts (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 25).

Overall, there is a lack of case studies focusing on the seventeenth century Devanagari Brahmanical manuscripts. Previous research on Indian manuscriptlogy is found conducted in the diversified areas. No research has so far been undertaken into account graphic design practices in India prior to the introduction of the printing technology.

5.2 Summary of Research

This section intends to outline the thematic content analysis of this explorative research work, as discussed in the previous data analysis chapter (Chapter IV). The findings on the three major themes qualitative analysis are furnished below.

5.2.1 Form and Function of the Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Publication Design

The experiments were conducted to explore structural page layout formats of the manuscripts, and the elements continued and practiced in the modern publication design revealed following results.

5.2.1 (a) Page Formats

The statistics of the data collected related to the page formats and sizes of the seventeenth century Devanagari Brahmanical manuscripts indicates that the most preferred page format practiced for writing manuscripts was landscape, and a very few were in vertical formats. The manuscripts sizes vary depending upon their functional and utility type. The manuscript which can be held in the fist of the reader called as *Musht; Gutka* is a small size center stitched manuscript; *Pustika* is a larger size manuscript; and *Potho* with many folios, etc.

No standardization of paper sizes was discovered in the seventeenth century Devanagari Brahmanical manuscripts as it is seen in modern publication design practices, e.g. ISO standard paper sizes. However, the dimensions of the particular type of manuscripts were almost close to the each other e.g. *mushti, gutka, pustika,* etc.

In modern publication designs, three types of page formats are in practice and they are portrait, landscape, and square. Books are available today in a variety of sizes, from small pocket size books to big coffee table books, as per their functional requirement.

5.2.1 (b) Page Turning System, Text Flow Direction

The findings of this study suggests that the ergonomic sitting posture during the seventeenth century India influenced to a large extent on the reading pattern of the manuscript. The traditional style or ergonomic posture for reading was sitting on the floor with crossed or folded legs with the manuscript kept in front for reading. This reading habit has influenced the page turning system as well as the ergonomic

convenience in handling folio. This arrangement has affected in formulating the visual design of folios, mainly in the area of the text flow direction and the orientation of the text on the front and backside of the folio.

The experiment has been conducted to understand the page turning system for the 'top' as well as for the 'left side' bounded books and their association with the text flow directions. The results revealed similarities between the seventeenth century Devanagari Brahmanical manuscripts and modern books in terms of page-turning, text flow, and the eye movement in context with the single column text. These types of page turning systems support the reading at ease as well as with uninterrupted text flow.

5.2.1 (c) Page Imposition and Binding System

Basic level of page imposition system is observed, in the seventeenth century Devanagari Brahmanical manuscripts. Two type of page imposition system evident to make the signature of the sheet, and they are:

1) Single folio with one page in each side of the page

2) Two folios and four pages per sheet. It is formed by making a single fold and placing two pages on each side of the sheet.

However, in a modern publication design, the number of pages arranged on front and backside of the sheet depends upon the (trim) size of the book. It also depends upon the maximum printing size of the offset printing machine. Nowadays, digital technology plays important role in the advancement of page imposition technique with the support of the software.

The major difference is observed in the binding systems of the seventeenth century Devanagari Brahmanical manuscripts and the modern books. For example, in modern books, the pages are bound together with the various type of binding techniques, whereas in the case of manuscripts, it is a bunch of loose sheets of folios wrapped up in a cloth tied with a string. Folios are found separate and not stitched or bound together with a thread, or glue.

Differences are also noticed while considering the stacking arrangement of books in the shelves. The modern stacking arrangement of the books in the shelves, project only the spine area to the reader. The spine area with the printed publication details plays a very important role while locating the particular book. The binding system preferred in the

seventeenth century does not provide any scope for the spine area, and hence lack in the effectiveness and efficiency in the binding system.

These finding suggests that the Devanagari Brahmanical manuscript designers of the seventeenth century followed rudimentary method for binding books. On the other hand, modern graphic designers, who are gifted with the new technology, applied various bookbinding methods (simple to complex) as per the functional and aesthetic demand of the job.

5.2.2 Composition and Layout Design: Page Structure, Typography, and Graphic Strategies

With the aid of visual deconstruction method, the elements dependable for composition and layout of the seventeenth century Devanagari Brahmanical manuscripts identified and compared their design aspects with the modern book design principles.

The study explored the organization of the content on a page by employing various strategies in structuring of page anatomy, grid system, typographic palette and various graphic strategies in the seventeenth century Devanagari Brahmanical manuscripts. It revealed information in the areas such as the page anatomy, distinct styles, patterns and simplicity factor and the minimalistic approach towards designing the manuscripts.

5.2.2 (a) Page Anatomy and Structural Components

Basic structural componenents of the page comprises margins, text blocks, headling / baseline grid, page navigation system, space planning for the visuals. They are found complimentary in the seventeenth century Devanagari Brahmanical manuscripts and the modern publication designs.

The seventeenth century Devanagari Brahmanical manuscript page layout found deficient in the multiple coloumns, sysmmetrical and asymmetrical column arrangements with gutter space and double spread recto / verso type mirror image page layouts as commonly practiced in the modern publication designs.

5.2.2 (b) Grid System

Template design process as noted in the seventeenth century Devanagari Brahmanical manuscripts is a clear indication of the design project-initiation process. Similarities are found in the template making process with the modern publication design process.

Project initiation process involves research, and exploring, developing and refining ideas for final page layout. It also includes selection of appropriate page size, format of the page, size of page, construction of grid and typographic style and attributes.

Four types of grid construction methods have been traced in the seventeenth century Devanagari Brahmanical manuscripts. A formal balance is achieved by employing following grid structures in page layouts of the seventeenth century Devanagari Brahmanical manuscripts.

1. The most accepted grid construction system in the seventeenth century Devanagari Brahmanical manuscripts is similar to the modular grid structure found in the modern publication design. It is a very simple, yet the effective system for the division of space for defining margin and the text block area. In this process, space is divided into equal horizontal and vertical parts resulting into rectangular modules or units. The one unit space at the edge of the page is distinctly left blank at the margin area and the inside area as a text block. These unit borders are also worked as guidelines to draw margin lines, i.e. *hasia* lines. Further, depending upon the text size and height, the text block is divided into equidistant horizontal lines as headline grid. Using unit places, the image area is determined. Positions for page navigation are considered to put running title and folio number. Similar kind of grid construction system is observed in one of the representative modern publication design. The only difference noticed in the page layout of modern publication design is that it does not include borderlines, as they are one of the prominent factors of manuscript page layout.

2. The *pothi* kind of page layout, which is a ‘horizontal - single column page layout’ with the headline grid and the page navigation system, found arranged in a peculiar style. It is the most admired format, which remarkably continued for the designing of religious Brahmanical modern books.

3. A modified version of the ‘*tripatha’* style grid structure is spotted in the modern publication designs. In a ‘*tripatha’* style, the main text is written in the vertical center of the page, and the commentary is written in the sections above and below. Hierarchical grid structure in the modern publication design has a similar type of structure with a modest difference is that instead of placing commentary above and below the main text, it is placed only below the main text.

4. A grid structure is based on the linguistic rhetorical composition patterns, which assisted manuscript designers to plan a page layout in units formed by headline grid. This type of grid structure is frequently available in the modern publication page layouts.

It is observed that once a grid structure was planned subsequently it was followed in the entire manuscript folios. Apart from the grid structures mentioned above, other types of grid structures are not found in the representative Devanagari Brahmanical manuscripts studied from the seventeenth century.

However, the dynamic page layout design by employing a variety of patterns and formats to construct grid structure is observed in the modern publications design. Few to mention here are page layouts with single, multicolumn, modular, mix, hierarchical, golden ratio with symmetrical and asymmetrical layouts, etc. Simple to complex patterns of grid structures are recorded in the most advanced form in the modern publication designs.

5.2.2 (c) Typographic Palette: Type Style and Paragraph Alignments

- Findings revealed that the seventeenth century Devanagari Brahmanical manuscripts were written in three different styles, e.g. (i) majorly in daily handwritten, (ii) beautiful mono-linear handwritten (same size thickness of strokes), and (iii) in calligraphic style with thin and thick strokes in a controlled manner. In a few representative examples, a fluid calligraphy with extended cursive terminals and vowel symbols are visible.
- Justified type of alignment is the most preferred option opted by all manuscript designers for writing text. Only the last line of the text varies with the left, or center type of text alignment. Manuscript designers have elegantly applied indented paragraphs to distinguish main text from the commentary in '*tripatha*' type of grid construction. Drop line type of text alignments are also noticed in late seventeenth century Devanagari Brahmanical manuscripts.
- The text forms are readable and legible. The gray value or the tonal value of the text encompasses the light, medium and bold styles.
- In most of the cases, the form of text, type styles and other typographic attributes are found consistent throughout the manuscripts. However, in a few cases, it is found that consistency was not maintained in the form of text.

- A large amount of manuscripts is written with no variation in typographic features. In a few manuscripts the variations in type size are observed. For example, in bilingual commentary type manuscripts, the main text is written with the big type size and in bold letters than the commentary.
- The range of characters per line found is a 24-58 character and the range of lines per text block noticed 12-17 lines.
- Only one type of text alignment i.e. justified type is applied for the text. It is found that if there was a shortage of the text for achieving justified alignment in the last line of the text then certain standardized symbols were added in the line to fulfill the requirement of text justification. In a few cases, the variations in the last line of the paragraph are observed with the left and centered alignment. Drop line type of alignment is rarely noticed in the later period of the seventeenth century.
- Left and right indentation of the text is common in the '*tripatha'* type of grid structure.

Applying typography is the key factor in the modern publication designs. There are plenty of digital fonts available and designers have to choose assorted, relevant font and their attributes for their artwork. The study revealed that the text is always used with variation in the types size, styles, etc. It is evident especially in the area of the headings, subheading, body copy, captions, etc. The purpose behind the change in the size of type is to achieve visual hierarchy in the design and to make page layout interesting by attention seeking catchy headlines. These types of composition strategies add rhythm and dynamic effect in the page layouts.

Primarily all four types of alignments i.e. left, right, center and justified types regularly applied for paragraphs noticed in the modern publication design page layouts. Alignments are used in combination and with indents. In text-heavy paragraphs, it is observed that the paragraph alignment is justified, however, the reading pattern of Indian origin scripts has influenced to keep the last line of the paragraph left aligned.

5.2.2 (d) Graphics Strategies

The scrutinization of the representative sample resulted in knowing that the effect of the technology and ease in acquiring content are influenced in liberal use visuals in modern publication design, however, in the seventeenth century Devanagari Brahmanical manuscripts illustrations are planned very carefully in page layouts.

Prominent features of the graphic strategies which are documented from the seventeenth century Devanagari Brahmanical manuscripts, precisely stated as under:

- The use of the limited text supportive graphics such as illustrations, tables, charts observed in the page layouts.
- Apart from the line justification symbols added at the end of the line, no extra illumination or decoration, patterns, motifs, etc. found in the page layouts.
- A few cover pages are found decorated with a line or floral patterns.

Application of graphics distinctively noticed in both the seventeenth century Devanagari Brahmanical manuscripts and in the modern publication designs on the front and the back cover designs, section separators, within chapter page, etc. A rare example is also noticeable in manuscripts i.e. pattern of illustrations in the background of the text. A similar type of image or pattern filled backgrounds are practiced in modern publication designs.

Basic similarities are observed in the space organization of visuals within the page layout of the seventeenth century Devanagari Brahmanical manuscripts and modern publication design. The grid structure is created in order to design a template used as the foundation for the space organization for visuals. Modular unit spaces in the case of the manuscripts and columns in the case of modern publication designs were utilized for placing visuals.

The major difference found between two are: the use of columns in the modern publication design with gutter space mainly worked as a padding white space between the visuals and text. It also provide tidy look to the design, creates a visual grouping, and gives rest to the eyes of the reader. However, in the case of manuscripts lack of gutter space between the columns resulted in the overlapping of text and visual borders resulting in chaotic, untidy and unorganized page layouts. This case is observed in the page layouts where visuals are painted with one or two colour borders around. This situation did not arise for those visuals that do not have borders. Full-size visuals rarely traced in the case of manuscripts but commonly practiced in the modern publication designs. Separate captions for visuals unknown in the manuscripts but often found for images in modern publication designs as crisp information besides the visual.

5.2.3 Layout Styles and Fundamentals of Page Layout Principles

Aesthetic elements in the composition of page layouts of the seventeenth century Devanagari Brahmanical manuscripts studied in this theme to understand the organization of information, various types of editorial styles, application of design principles in the composition of page layout, and influence of other contemporary design school on the style of manuscript page designs. Results are compared with the modern graphic design principles.

5.2.3 Part A: Organization of Information in the Seventeenth Century Devanagari Brahmanical Manuscripts and Modern Books

5.2.3 Part A (1) Segments of the Seventeenth Century Devanagari Brhamnanical Manuscripts and Modern Books

The careful inspection of the manuscripts revealed information placed within every manuscript, and the modern publication design can be categorized under different sections or parts of the document. While scrutinizing the representative manuscripts and compared with the modern book design, subsequently the following parts are noticed common in both: front and back cover pages, section separators for beginning and end of chapters.

Dissimilarities have also been noticed in the presentation of information under various segments in both the cases.

- Every manuscript has followed a particular structure to present information such as salutation to god or teachers. A peculiar rhetoric structural, a standardized style known as '*anubandha chatushtya'* is employed in the manuscripts to explain the type of reader of the particular text, the purpose of the text, its subject, and its relation to various disciplines. The text is written in a horizontal continuous manner in case of most of the manuscripts. The paucity of material i.e. paper, probably was the reason behind it. However, various physical segments e.g. cover page, copyright page, dedication page, full title page, foreword, preface, acknowledgment, introduction page, table of content, index page, section separator etc. were presented in a specific order and on mostly printed on separate pages in modern publication designs.
- The purpose of the front and back cover pages in the seventeenth century Devanagari Brahmanical manuscripts was either to display information regarding

the book title or beginning of the text. The back cover was not necessarily in practice during this period. However, in a few cases the back cover reveals information stating the end of a particular chapter or text.

- The practices of various types of colophon indicate a different type of information related to publication. For example, the publication information, end of chapter (of section) information and end of text information are found very much common in the seventeenth century Devanagari Brahmanical manuscripts.
- In the seventeenth century Devanagari Brahmanical manuscripts, the segmentation of sections mostly observed in continuation with the text, and occasionally text-oriented or illustrated section separators are introduced in the manuscripts.

However, the pattern of information is almost similar in both the cases; the representation style found is distinctive.

5.2.3 Part A (2) Layout Editorial Style and Structure

Various editorial styles were employed in the seventeenth century Devanagari Brahmanical manuscripts depending on the single or bilingual text and orientation of page i.e. portrait and landscape.

Evidence do support that in every manuscript the design process began with the predefined editorial style with a definite form and size of the folio, grid construction, template design, and space management for the content organization.

For designing single text manuscripts with the landscape page formats, two types of editorial styles are noted in the representative manuscripts. In these manuscripts, the verses are written in a horizontal format.

- In the first style, the verses are not numbered but the section numbering is denoted in the text format in line with the other text. To distinguish the difference between the two type of information, extra space added before and after the ‘end of section’ verse.
- In the second editorial style, the rest of the layout design is similar to the first style, and the only difference is that verses are being numbered.

Both these editorial styles are accepted in the modern Brahmanical publication designs with few changes, e.g. change in typographic attributes for heading, body text.

For designing single text manuscripts with the portrait page formats, a unit based editorial styles are noted in the representative manuscripts.

- The editorial style employed in the portrait format of the seventeenth century manuscript page layouts is made of a headline grid - page layout structure. Units are formed from these headline grids which further utilized in the formation of text area, stanza numbering and for the extra space between two stanzas. This editorial style is also selected in the modern publication designs with a few adaptations, e.g. change in typographic attributes of heading and body text.

For designing bilingual manuscripts with the landscape page formats, two types of editorial styles have been observed in the representative manuscripts. These manuscripts include main text and its commentary in two different languages. However, the script is the same for both of them i.e. Devanagari.

1. In type 1 of bilingual editorial style, the text is written in a horizontal line. The textual indication has been provided at the beginning of the main text and commentary. Verse numbers placed after the main text and the commentary, assist a reader to know their current position in the manuscript. Verse number of a commentary is found occasionally matching with the verse number of the main text or else has different number.
2. In type 2 of bilingual editorial style, a '*tripatha'* style of grid structure implemented for page layout and composition of elements. The main text, e.g. text in *Sanskrit* language is written in the vertical center of the page and the commentary in *Marathi* language, written above and below the main text. Commentary verse number found occasionally matching with the main text verse number.

In modern publication designs, three types of editorial styles predominantly noticed

1. (i) Publications related to Brahmanical single text are found composed in a horizontal manner. The verses are placed one after the other in the horizontal direction, and the verse number is positioned at the end of the verse in a line. This editorial layout style is the imitation of the seventeenth-century single-text landscape format type of layout. However, the only difference noticed in the modern publication design is the application of design principles e.g. contrast and proportion in the typographic style of heading. The headings found bigger in size and bolder than the body text, reflecting clear visual hierarchy.

(ii) Publications related to Brahmanical single text, composed in a portrait manner, have a parallel editorial style as noticed in the modular unit based editorial style. The editorial style that is practiced in the portrait page layout single text page layouts noted in the seventeenth century Devanagari Brahmanical manuscripts. The difference is noticed in the modern publication design in the areas such as typographic styles, application of contrast and proportion principle in the typographic style of heading. The headings found bigger in size and bolder than the body text, indicating clear visual hierarchy.

iii) Publication editorial style comprises multiple columns and rows. In such page layouts more than one articles related to one subject are placed on a single page.

2. The strategy employed in the bilingual modern publications is distinct from the seventeenth century Devanagari Brahmanical bilingual manuscripts. For example in modern editorial styles:

   i) Main text and commentary are arranged one beneath the other in vertical text flow format. The order of the text is ‘m-c-m-c’ i.e. main - commentary - main - commentary, with vertical text flow direction. Occasionally the main text and the commentary are assigned serial numbers. This editorial style is partially similar to ‘*tripatha’* style of the seventeenth century Devanagari Brahmanical bilingual page editorial style.

   ii) Use of parallel columns to accommodate bilingual content (one language or script per column)

   iii) Utilization of page spreads (left and right) to place bilingual content. (one language or one script per page).

2. Appropriation in editorial styles — The same subject is presented with variety in layout whereas the format is imitated in all page layouts. This imitation of format is not just because of the aesthetic reason but also for the functional reason. Mainly, the process is presented in such type of page designs.

The findings of this study reveal the repetition of the page layout editorial styles of the seventeenth century Devanagari Brahmanical manuscripts and shows a close association with the ‘appropriation’ principle having practiced in modern publication design.

5.2.3 Part A (3): Page Navigation System

The folio numbers are traceable on only one side of the manuscripts. Similarities are noticed in the seventeenth century Devanagari Brahmanical manuscripts and modern publication designs' page navigation system. Such as running titles and abbreviated running titles are found on almost all the manuscripts folios placed within the margin areas. In the case of horizontal format manuscripts, the page navigation system is arranged in the left and right margins of the page. However, in the case of vertical format, a page navigation system is placed in the top margin or the header area. These observations are close to the modern publication designs. However, accessing information within a book, using modern page navigation system is more systematic and easy. The page navigation system in modern publication design is more efficient than the seventeenth century Devanagari Brahmanical manuscripts. Because it encompasses table of content page and index entry section along with the use of regular running title and page numbers.

In all, the study suggests that the manuscripts show transitional page navigation system which incorporates not only full or abbreviated running titles and folio numbers placed in the margin area but also they included navigation system within the text area. A fewer examples can be quoted, such as verse number, stanza number, end of section number, end of chapter number, etc. These numbering systems within chapter and the folio numbers must have surely assisted the reader in marking and knowing their current position within the manuscript. Similarly, it must have guided for further continuation of reading even after few breaks in the reading. This page navigation system seen replicated in the modern Brahmanical landscape format page layouts, with certain modifications.

5.2.3 Part B: Layout Styles and Fundamentals of Page Layout Principles

5.2.3 Part B (1): Chapter Opening Pages — Entry Point

The study revealed that every manuscript begins with a 'salutation to God' or teacher. In most of the manuscripts, no variation is noticed between the size, colour, tonal between the entry point text and the rest of the text in the manuscript. However, a few techniques to highlight the entry area is observed. In one type the entry point text found highlighted with rubricating effect, and in another type the extra space has been added either before and after entry text or only after entry text area. These methods show

effective use of principles of design, such as emphasis effect, contrast in colour, and white space. Additions of white space also helped in achieve emphasis in the entry area of the page layout.

Big attractive, catchy headlines with the bold and colourful letters, single or colourful drop capitals, indented paragraphs, etc. are observed in the representative modern publications. These are few common features of the entry points of the articles in the modern publication designs. **Visual hierarchy** is achieved in the modern page layouts by employing typographical variations in various type of information using **contrast** in the size of text, tonal value, white space colour, etc. This approach leads the **readers' eye movement** within the page layout guiding them the **order of reading**. Consistency is maintained for the defined category of information throughout the book.

The study also revealed that the most of the chapter-opening pages in the manuscripts found mainly stationary with few exceptional lively cases.

5.2.3 Part B (2): Design Principles and Page Layout

Consistency: One of the most important finding revealed that in most of the seventeenth century Devanagari Brahmanical manuscripts, majorly no variations is observed in the calligraphic attributes such as style, size, colour, tonal values, the spacing between the lines, etc., in the entire manuscript. This has resulted in achieving **typographic consistency** in page layout. Variations in type size and tonal value are noticed in the representative samples of the mid and late seventeenth century.

The findings of modern publication designs revealed that attentions seeking bold display types are chosen mainly in the headings, which are clearly visible from longer distance. They generate interest amongst the readers. The kickers and subheadings provide additional information about the articles; they are mostly bold and bigger in size than the body text. This variation in typographic attributes by adding contrast and proportion makes page layout interesting and dynamic. Design principles such as contrast, proportion, value works very well achieve effects e.g. visual hierarchy in the page layout.

Colour, Emphasis, Contrast: The findings of qualitative representative manuscript studies uncovered the limited and controlled application of colour in the text of manuscripts; and it is found relevant and appropriate. Two types of colour application are observed in the text area. Colour with transparency effect and solid colour are

employed in the page design to highlight or emphasize certain category of text, e.g. rubricating ‘salutation of God’, punctuation marks (*danda*), verse number, end of the section, etc. Adding contrast by applying colour in the text at some degree assisted the reader in knowing the current position in page very easily. Application of **colour** in the text area not only improved the **aesthetic** value but also enhanced the **functionality** of the manuscript. Standardization of yellow colour also noticed for deleting the text area in the manuscripts.

Simple to complex representative modern page layouts were scrutinized to study the application of design principles in modern publication designs. The observations revealed that **colour** element is used predominantly in the text areas of the modern publication designs. However, single colour i.e. black colour printed books are also available with variation in the text size. In such layouts, contrast and proportion in the size as well as in the tonal value deliberately employed to show levels of information. **Contrast** in type size is noticeable for heading and body text, resulting in achieving **visual hierarchy** in the layout. In two colour page layouts, generally heading and subheadings are in same colour, and the body text preferably in black. Thus, colour, contrast, and emphasis work as attention seeking elements. Various appropriate colour harmonies are also found considered while the selection of the colour in the page layout, sometimes colour chosen compliments with the images placed within the layout.

Consistency is maintained in the typographic attributes among the level of information. It is also observed in the graphic styles employed in the page layout.

5.2.3 Part B (3): White Space

White space is found actively employed in the seventeenth century Devanagari Brahmanical manuscripts to distinguish the difference between mixed types of information. It demonstrated visual grouping or as chunking of information.

The study to explore template-designing process in the manuscripts revealed that white space was defined during the template making level. The deconstruction of the grid structure of representative manuscripts validated making use of leading, i.e. the space between two successive lines planned while configuring the headline grid structure of the manuscript. It was also employed in various other areas, such as margins at the entry point area i.e. between ‘salutation to God’ and rest of the text, between two sections, end of the section, end of the verse. In ‘*tripatha’* editorial style, a white space is

especially introduced to draw the attention towards the main text area. It is planned in the form of left and right indent space.

Digital deconstruction method has revealed the use of white space in the two representative manuscripts with the portrait format page layout; and the text arranged in the modular grid unit format. The extra space added in the predefined unit form in the vertical direction help in improving readability factor within a document.

In modern book designs, white space is used liberally. It is employed in the margins, between the title and first paragraph of the article by indenting the first line of the paragraphs. White space is also employed between paragraphs, two successive lines (leading), words, columns (gutter space), padding for images, for blocking title, etc. White space employed in the layout acts as a highlight, and at times it relaxes readers' eyes.

5.2.3 Part B (4): Balance in the Page Layout

Application of principles of design such as visual hierarchy, contrast, proportion, colour, white space and strategy for the composition of the content in page layouts using grid structures play a vital role in bringing balance and rhythm in the page layouts. Thoughtful arrangement adds visual movement, and constructs cohesive unity among all elements in order to create balance and rhythm in the entire design.

In representative modern publication page layouts **symmetrical as well as asymmetrical** balance are noted. It is formed because of the distribution of content along the axis of the page and their respective alignment. However, the entire arrangement of the content including the fundamental of designs and application of colour, made it cohesive to form visual unity and harmony in the page layout.

5.3 Limitations of the Present Study

The major issue in this qualitative research was to select samples and determine the sample size. The manuscripts written in the seventeenth century are huge in numbers, around five lacks, as estimated by National Manuscript Mission, India (Indian Manuscripts: What is Manuscript, 2007). They are spread across the entire India including the state within it i.e. Maharashtra. The limitation of the study was that the researcher could not reach out to every manuscript because of the three reasons: The

first, geographical limitation; the second the manuscripts are in the collection of many repositories, institutions, and in the personal collection; and the third limitation of time and financial resources. Therefore, the scope of the study intentionally narrowed down in geographical aspect and chosen the region, Maharashtra. The researcher identified various categories that were required for the study of layout and compositional styles, and finally selected representative manuscripts for the study. While comparing these seventeenth century Devanagari Brahmanical manuscripts with the modern publication designs, a similar approach, as mentioned above was followed. In case of modern publications, various genres with functional, aesthetics, and utilitarian design with selective application of design principles are carefully selected for the research.

5.4 Implications of the Findings

This study intends to suggest evidence to understand various categories related to the publication design such as the form and function, page anatomy, page turning system, page imposition system, template design process, grid system, and page navigation system.

The study appears to support the arguments for the distinct system, editorial styles, and pattern for manuscript design. It provides evidence through exploring grid system, an organization of information, typographic palette, layout editorial styles for single and bilingual text, and the graphic strategies employed in the seventeenth century Devanagari Brahmanical manuscripts.

This study also substantiates the manuscript designer’s approach towards simplicity. They essentially focused on the content, e.g. the text and the use of minimalistic approach to other factors such as decoration and ornamentation. The evidence from composition and layout design theme as well as the graphic strategies employed by the archaic designers supports this argument.

This study would also like to suggest evidence for the application of design principles in the composition of page layouts by the manuscript designers by exploring page layouts on the grounds of design principles.

5.5 Recommendations

5.5.1 Future Research Scope:

In this study, there is an ample of scope to conduct similar kind of research in the other culture specific manuscripts of Indian origin or from a nearby region. For example Jaina, south Indian, Nepali, etc. can be taken up to understand the broader aspects of the page layout composition and design approach in the seventeenth century India.

5.5.2 Future Action/Policy:

The study demonstrates that the current culture specific Indian publication designs are the amalgamation of the old and new. However, there is a need to change the cultural design approach as the publication designers from China and Japan successfully implemented it. Graphic designers like Sugiura Kohei and Lu Jing-ren incorporated old Japanese and Chinese cultures and traditions in their book designs. It is recommended that the students of graphic design should be introduced the topic of history of design in Indian cultural context, and they should apply this knowledge to the contemporary design principles and produce exceptional culture specific publication designs.

5.6 Contribution to Research

This is a conscious attempt in undertaking the original research work with the totally new approach to the study Indian publication design history. This subject has not been explored yet, and has very limited published literature. This study has made a number of contributions in the field of history of graphic design in India. Firstly, the study contributed in the area of ‘grid structure’ and ‘template design’ process for seventeenth century Devanagari Brahmanical manuscripts. The use of various types of representative manuscripts for the study has enhanced the originality of the study. It has added altogether a new perspective in the study of Indian manuscripts. Therefore, the researcher hopes that the findings of the study will attract the history of design and graphic design fraternity’s attention to this perception. This investigation will also assist and guide the scholars working in the area of Indian manuscriptology.

5.7 Autobiographical reflection

Undertaking this research has been an invaluable experience, which helped the researcher grow personally and professionally. To elaborate further the researcher

developed personally by imbibing discipline, organization, time management etc. It has also added professional values that researcher started presenting her research work at the national and international conferences in the related field and finally published research findings. As an academician it has benefited her in understanding and upgrading the knowledge of the publication design, a specialized area of graphic design in depth. The pursuit of this study reflected in the teaching skills, techniques and methods with the new innovative approach. Ultimately, it reflected in guiding students in their degree projects more resourcefully. The outcome of this study is that the researcher has published three research papers. Out of which two are related to discussions on Indian medieval culture specific publication design aspect (Ranade P. , Use of Eye Movement Tracking Technique in the Study of Layout and Composition Design of Indian Manuscrits), (Ranade P. , Form and Page Turning Function of 17th century Devanagari Manuscripts of Maharashtra (India) , 2015). The third research paper discusses the contemporary design process and use of cultural and traditional elements in the publication design (Ranade & Kaeosa-Nga, Design Education: Strategic Design Process and Publication Design on Thai Costume, 2016). All these research papers are subsequently read and downloaded by many national and international scholars. The feedback received from the academic scholars has added the zest in the pursuit of this research work.

5.8 Conclusions

The findings of this qualitative study and the evidences collected uncovered the following results related to the layout and composition, and the design process followed in the seventeenth century Devanagari Brahmanical manuscripts.

The critical analysis of the manuscripts strongly suggests that the design process practiced for producing the seventeenth century Devanagari Brahmanical manuscripts is similar to the design process of the modern publication design. The process involves following key areas: defining form, structure and size of the final product, page anatomy, page turning system, text flow directions, template design system using the grid structure, typographic palette, utilization of layout editorial styles for organization of information and content, graphic strategies in the layout, and implementation of design principles (Plan - Design - Develop - Distribute). These evidences support the hypothesis: a structure of manuscripts contains many elements, which are continued in modern publication design

The analysis has revealed that maximum numbers of Devanagari Brahmanical manuscripts designed in the seventeenth century are in landscape page format, as they followed the conventional method. Very few manuscripts designed in the portrait format. Depending upon their sizes and function of the manuscripts they are classified and assigned nomenclatures, such as *mushti, gutka, pustika, pothi,* etc. However, modern publication designs are classified under their function and genres, e.g. magazine, novel, newspaper, text book, pocket size books, coffee table books; and their sizes are related to the genre.

The analysis also disclosed the general stages that followed in the manuscript template design process. The stages involve: selection of paper of required size, division of space in the modular grid format, define margin area, draw left and right border lines, construct the baseline grid depending upon the type size and required number of lines per page, structural positioning of the content on the page layout such as text, illustrations, and page navigation system, etc. The study also revealed the skillful arrangement of the structure of the page in the manuscripts. Appropriateness represented through the selection of specific types of editorial styles for single or multilingual manuscripts. The evidence of grid construction method also brought to light the geometrical nature of the manuscript. In all, the results of the qualitative analysis indicate the systematical approach and methodology employed in the design process with form, shape, visual conceptualization and aesthetic appeal with functionality in design. These results support the hypothesis in relation to the distinctive system, style, and pattern practiced in the seventeenth century Devanagari Brahmanical manuscripts. These evidence do support the hypothesis namely, many structural elements of manuscripts are continued in modern publication design

Few observations need to be deliberately highlighted namely; a few manuscript designers opted for experimental page layouts in portrait format with breaking most of the rules practiced in contemporary tradition of manuscript design. (*Shree Samarthakruta Yuddhakanda Prata* by *Sri Ramadasa Swami*, '*Kalyanpotha* by *Kalyanswami* 17th Century AD). The effectiveness of these layouts lies in their content organization, navigation, and the presentation techniques. The key features of these manuscripts are: removal of *hasia* borders, the introduction of full-page illustration without page borderlines, followed the basic modular grid construction method to define one space margin area, and then effectively created units out of headline grid to place the textual content. Navigation system practice by adding stanza number, which is

written below the stanza, automatically created white space between two stanzas, and it worked as paragraph space as practiced in modern publication design. It formulated the chunks of paragraphs and visual grouping of elements on the page. Finally, the entire page is represented the coherent design.

The grid construction method is found employed so as to divide the page into the modular grid. This resulted in the distribution of space equally in horizontal modular and vertical modular units. These modular units have further utilized for the positioning of the page elements. These elements show totally different approach of grid construction and content organization and management from the trends and patterns accomplished by their contemporary Indian or other cultural traditions, e.g. Jaina, Islamic Hebrew, Roman, etc. (see appendix C). All the above evidence do support the argument that the seventeenth century Devanagari Brahmanical manuscripts does not show any influence of other contemporary design schools nor they accepted any other style in their design. These evidence also support the distinct system, style, and pattern in the Devanagari Brahmanical manuscript designs in the seventeenth century.

In the study related to the organization of information in the seventeenth century Devanagari Brahmanical manuscripts, it has been found that there was a systematic approach to orgize the content of the manuscript into different parts. The content thus arranged in different parts occasionally show use of separate pages or in the continuation of the text. Every manuscript has physical parts such as front covers, infrequently back cover also. Section separators for the beginning and end of the chapters, introduction, generally three types of colophon (in the beginning of text, at the end of section or chapter and at the end of text), and numbering system for verses, stanzas and sections along with the page navigation system. A predetermined rhetoric style influenced for writing the introduction was ‘*anubandha chatushtya’*. It is a standardized system through which the reader has been provided introduction regarding; for whom this text is, the subject of the particular text, the purpose of writing, and its relation to various other disciplines. All these simple and functional rational design aspect support that the seventeenth century Devanagari Brahmanical manuscripts are not only geometrical in nature but also they are logical and effectively presented content in proper order.

One of the themes emerge from this analysis in the area of typography is that the manuscript designers have followed their contemporary design trend related to

typography. This theme is evident through literature review related to typographic approach (Pangarkar, 1990, p. 688), (Prasad, 2007; Satyendra, 1978, p. 85). Influence of the literature resulted in maintaining consistency in the typographic attributes with no variation in size, gray value, leading space, style, etc. in entire manuscript. In the later period, the manuscripts were written with variation in text size and contrast to show visual hierarchy, e.g. *Bhagvad Geeta - Satikah* (1696 AD) and *Bhagavata Purana* (1948 AD). The type styles employed in the manuscripts are readable, legible, and coherent.

A minimalistic approach, laser focus, and effectiveness are the keywords that support the graphics strategies employed in the seventeenth century Devanagari Brahmanical manuscripts. The manuscript designer was exposed to the various types of geometrical, artistic design patterns, motifs, etc. through their religious and social environment e.g. temple architecture, floor art (*rangoli*) patterns, etc. Still, they have chosen the minimalistic and simplistic approach in their page layout design. It is recorded in the study as careful and limited use graphics in the manuscripts. Application of graphics in page layout studied has revealed that it was dependent on the focused group for whom the manuscripts were designed. The manuscripts with old religious scriptures, e.g. *Rigveda* did not have visuals but diacritic marks for linguistic support. Simple line-art illustrations or inline tables or charts were introduced in the geometry and mathematics related manuscripts (*Kundamartanda* 1688 AD, *PateeGaneeta,* 1661 AD), and full page colourful visuals in the case of manuscripts with poetic, and mythological genres (*BhagavataPurana,* 1948 AD). This approach to design manuscript must have the definite reason and the study do supports the reason. With this minimalistic designs, the focused approach and the requirement of the assignment undertaken, ultimately manuscript designers avoided unwanted design elements in their page layouts as they are evident in the manuscripts of other cultures e.g. Jaina manuscripts. Design approaches can be associated with their traditional, aesthetic, cultural, habitual and functional demand, instead of economical factors or rigidity as suggested by the scholars in the previous work

One significant reasoning discovered in the study related to the untidy look. It is the result of overlapping image borders and text in the seventeenth century Devanagari Brahmanical manuscripts. The reason in the selection of the basic grid construction method; the system of grid construction in the manuscripts did not provide a gutter space or white space in between two modular units. Both the manuscript scribe and the

illustrator have followed the same demarcation line for their area of work. As there was no padding space, it resulted in overlapping effect. This problem is overcome in the modern publication designs by the introduction of columns with gutter space in the page layout. Gutter space works as padding space or white space between text and visuals, and eventually this composition technique results in a grouping of information and uncluttered, organized look in the page layout.

Page turning system, the orientation of the text on the page, page navigation system, limited use of colour palette in the page layout, standardization of colour gives, and the introduction of white space in order to distinguish different type of information in visual groups reveal the manuscript designers' clear understanding of the user requirements while reading the manuscript. This system has enhanced the effectiveness and efficiency while reading the manuscripts.

The study has explored the nature of practice of fundamentals of design in the page layouts of the seventeenth century Devanagari Brahmanical manuscripts. The findings validate that many design principles such as consistency, repetition, proportion, scale, contrast, harmony, balance, visual hierarchy, emphasis, order and tension were utilized in the manuscript page layouts along with the design elements such as line, colour, white space, etc. As a result, it built an interest in the pages by pulling up the visual hierarchy, visual order, a grouping of information, etc.

- Space organization using grid structure has helped to create the template. The template maintained consistency in the structure of a page as well as in the entire manuscript. The page navigations system is repeated on all pages consistently. Consistency is also maintained in the typography to demonstrate the level of information.
- Tension is created in the layout by adding vertical borderlines in the left and right margin area; it restricts the readers' eye movement in the horizontal direction and eventually the reader moves to the next line.
- Visual hierarchy is achieved by adding colour or scaling in the size and the proportion of the element. For example, the main text in the '*tripatha'* style is bigger and bold than the commentary text. By rubricating, certain text aid in the emphasizing of the certain elements. By maintaining the consistency in such elements, it supports reader's visual memory.

- Thoughtful use of extra white space between two types of information e.g. between two verses, or stanzas, in the beginning of chapter or end of the chapter, facilitated forming visual groups and support effortless reading by resting eyes in the text based page layouts.
- Formal balance in a page layout is achieved mainly by the justified type of text alignment and positioning the other elements in a design such as margin lines, running titles and folio numbers. The introduction of drop line alignment in '*tripatha'* style page layout has added visual movement in the design. Application of colour, contrast in tonal values in the text, has further added excitement to the page layout.

All these processes and techniques along with fundamentals of design transformed the seventeenth century Devanagari Brahmanical manuscripts aesthetically pleasing. They are user-friendly, utility oriented and functional. All above-mentioned evidence support the hypothesis, manuscript designers employed design principles for the composition of page layout designs.

The study has explored the continuation of page layout formats and various aspects in modern publication design. These formats are practiced in single column text mainly in novel and Devanagari Brahmanical modern publication designs. Modular unit based text is observed in the poetical genre modern publication designs.

The study has revealed that in the modern Devanagari Brahmanical publication designs a commonly practiced format based upon the seventeenth-century manuscripts is a page layout with landscape orientation and the verses composed in a horizontal manner with inline verse number. The page navigation system is arranged in the left and right margins and borderlines occasionally enhanced with geometrical or floral patterns. Although the standard in writing Devanagari script is given serious attention by the government authority, the punctuation marks (*danda*), and diacritic mark system remained unchanged in the Devanagari Brahamincal text. The continuation of the formats have been adapted with modern design principles, e.g. the use of visual contrast, proportion, colour to show visual hierarchy among the levels of information. The continuation of page layouts format shows readers cultural connection.

Although most findings are generally compatible with the design concepts of the seventeenth century Devanagari Brahmanical manuscripts and the modern publications designs, however they differ in several areas. Comparative study has revealed that the

seventeenth century Devanagari Brahmanical manuscripts page layouts deficient in columns, pages with spreads (recto and verso), asymmetrical balance in the layout, stitching or gluing type of binding systems as provided in modern publication designs. However, the use of captions, title, footnotes, visual hierarchy, and the dynamic arrangement of text in various types of fonts and various type of grids makes entire contemporary page layout arrangement logical.

While comparing modern publication designs with the seventeenth century Devanagari Brahmanical manuscripts, many advanced forms of design features are noticed in the modern publication designs

Seventeenth century Devanagari Brahmanical manuscripts have necessary visual and aesthetic qualities in consideration with social, political and technological aspects of the seventeenth century. They have continuity and have a link between the past and the present.

These three major themes have formed the basis of the six hypotheses of the study. The conclusion of the study asserts the validation of six hypotheses.

Appendix A

Digitization of the Seventeenth Century Devanagari Brahmanical Script

Devanagari Brahmanical manuscripts written during seventeenth century in various scripts are personal expression of the artists as well as the historical and cultural information of the contemporary society. Every manuscript covers a variety of themes, textures and aesthetics, scripts, languages, calligraphies, illuminations and illustrations.

The manuscripts produced aesthetically in India in the seventeenth century are inheritance of intellectual class. This class depended on the hand written medium to store the knowledge and information for themselves and posterity.

Digitization of script has been suggested in order to preserve this extra ordinary inheritance and expression of calligraphic writing skills. These digitized scripts can be used with some modifications in very few syllables to match them with contemporary Devanagari letterforms styles of the twenty first century. This initiative will revive our traditional, cultural lineage of the seventeenth century Devanagari Brahmanical manuscript.

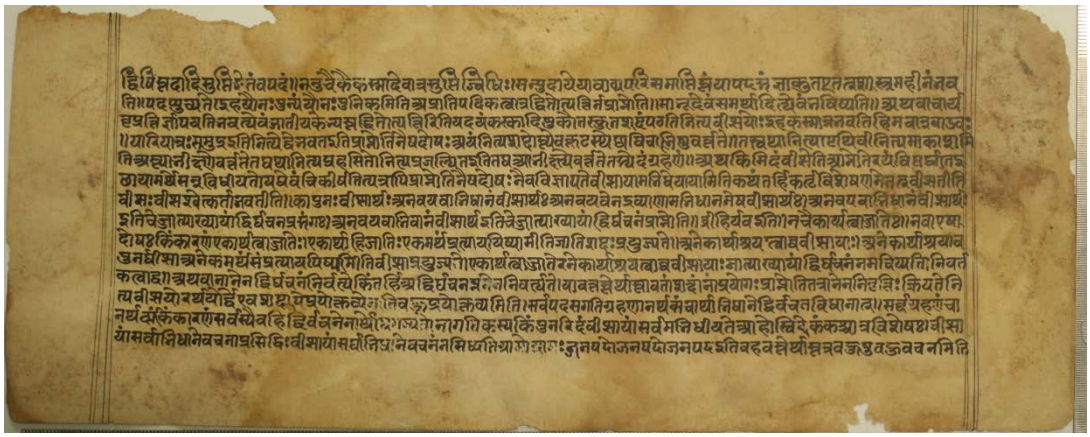
Method to Convert Handwritten Letterforms into Digitized Vector Forms

Tools Used: Digital Camera, Flatbed Scanner, Tracing Table

Software: Adobe Photoshop, CorelDraw, Adobe Illustrator

Step 1:

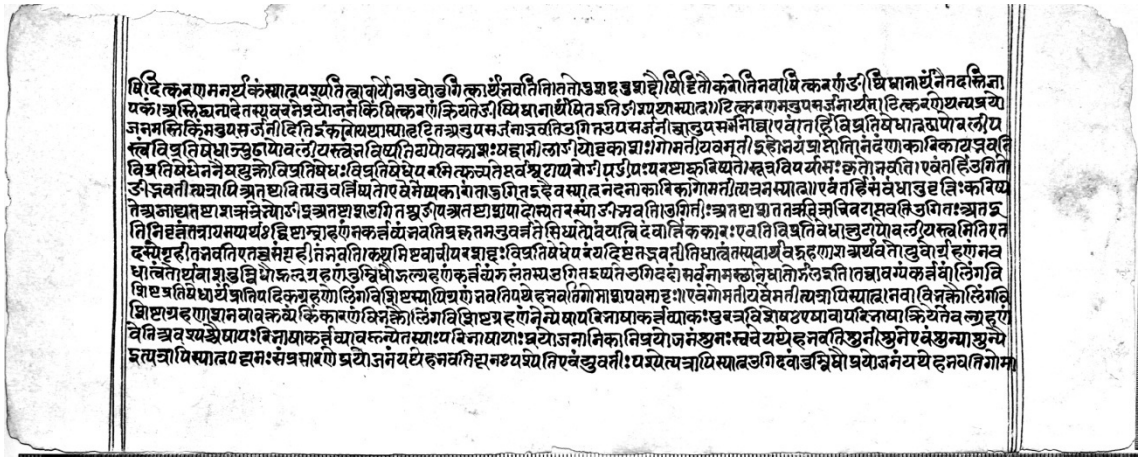
Identification of a representative manuscript with legible and readable letterforms to digitizing letterforms



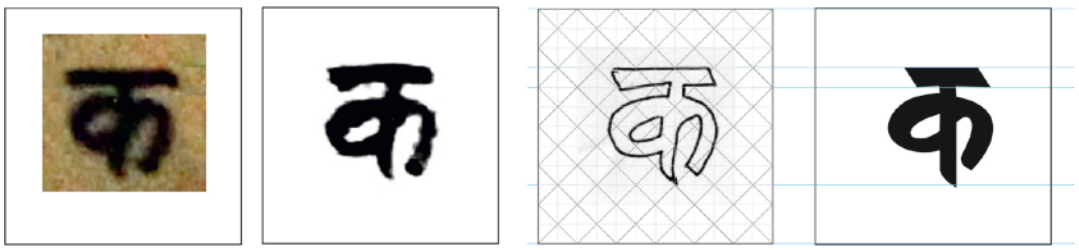
Appendix A 1: *Patanjali Mahabhasya*, Original Manuscript, 1653 AD, DC

Step 2

Restoration of image by cleaning edges and adding the sharpness and contrast by application of digital tools



Appendix A 2: Restoration of image by cleaning edges and adding the sharpness and contrast using Adobe Photoshop



Step 1

Identification of Individual Letterform

Each vowel, consonant and numeral identified as a single letterform from the manuscripts pages. Further each letterform cropped individually from page.

Method: Digital

Tool used:
Adobe Photoshop

Step 2

Cleaning and Sharpening of Letterform

Removed background area around the letterform. Contrast level of the positive space increased to sharpen the character.

Method: Digital

Tool used:
Adobe Photoshop

Step 3

Tracing of Letterform

Using horizontal, vertical and diagonal grid each letterform from Step 2, traced to understand basic form and structure.

Method: Mannual drawing

Tool used:
Light box for tracing

Step 4

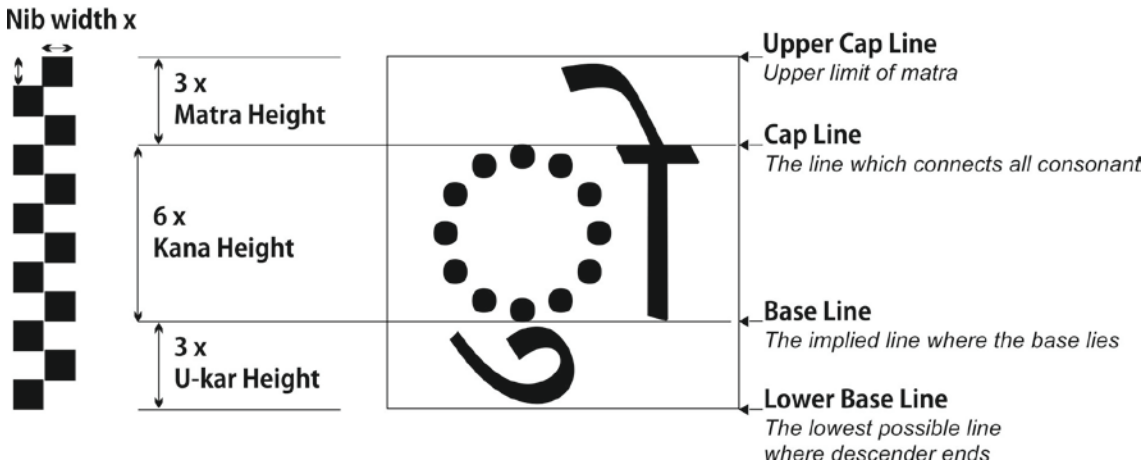
Digitization of character

Scanned letterform finally converted into digital form. Considering 12x nib height, horizontal grid used to draw characters. 3x for Matra height, 6x for Kana height, 3x for U-kar height.

Method: Digital

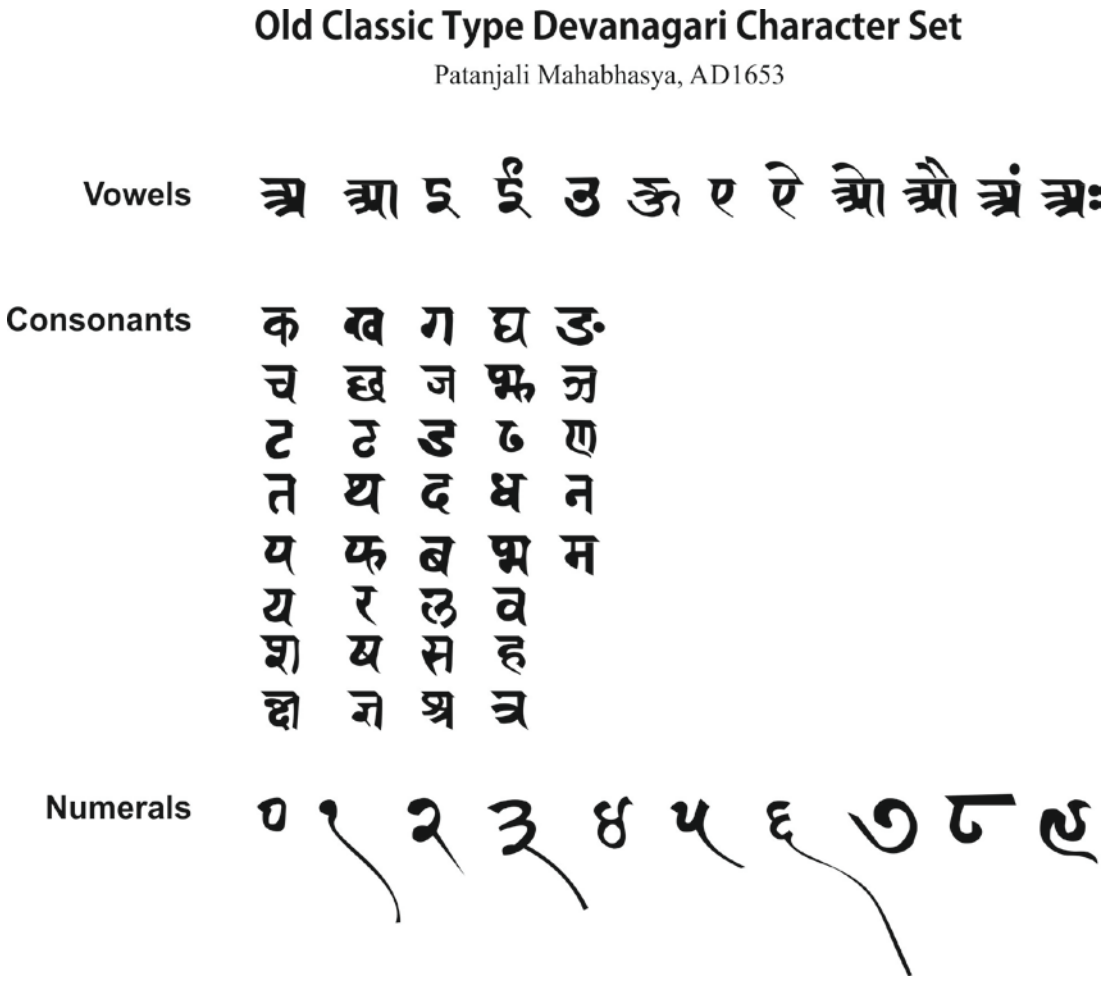
Tool used:
Adobe Illustrator, CorelDraw

Guidelines to Draw Letterforms based upon Tool Size



Appendix A 3: Guidelines to draw Devanagari Letterforms

Vector Letterforms of Old Classic Type Devanagari Character Set



Appendix B

Post-17th Century Devanagari Brahmanical Manuscripts

Layout Design Features

- Horizontal layout format, text orientation, page turning system, loose folios, and binding style are similar to as seen in the seventeenth century Devanagari Brahmanical manuscripts

New features observed in the layout and compositions are as follows:

- Use of rectangular frame / border around text instead of only double line vertical borders on left and right margin *hasia* lines
- Margin areas are decorated with multicololur floral, geometric, animated patterns
- Dynamic layouts with juxtaposition of text, illustrations and illuminated narrative stories written within interesting shapes
- Thoughtful division of space to accommodate multiple illustrations
- Heavy use of rubricated text
- Moderate use of multicolour in images
- Decorated / illustrated wooden planks added to support loose folios
- Influence of Islamic manuscripts design



Appendix B 1: *Sachitra Geeta Pancharatna*, 1745 AD, Courtesy: SVM



Appendix B 2: Decorative Cover Pages, *Dasbodh*, ND, Courtesy: SVM

Heavily illustrated, multicolour folios with Geometrical Division of Space



Decorative wooden planks placed above and below manuscript folios for protection



Geometrical division of space



Narrative illustrations.

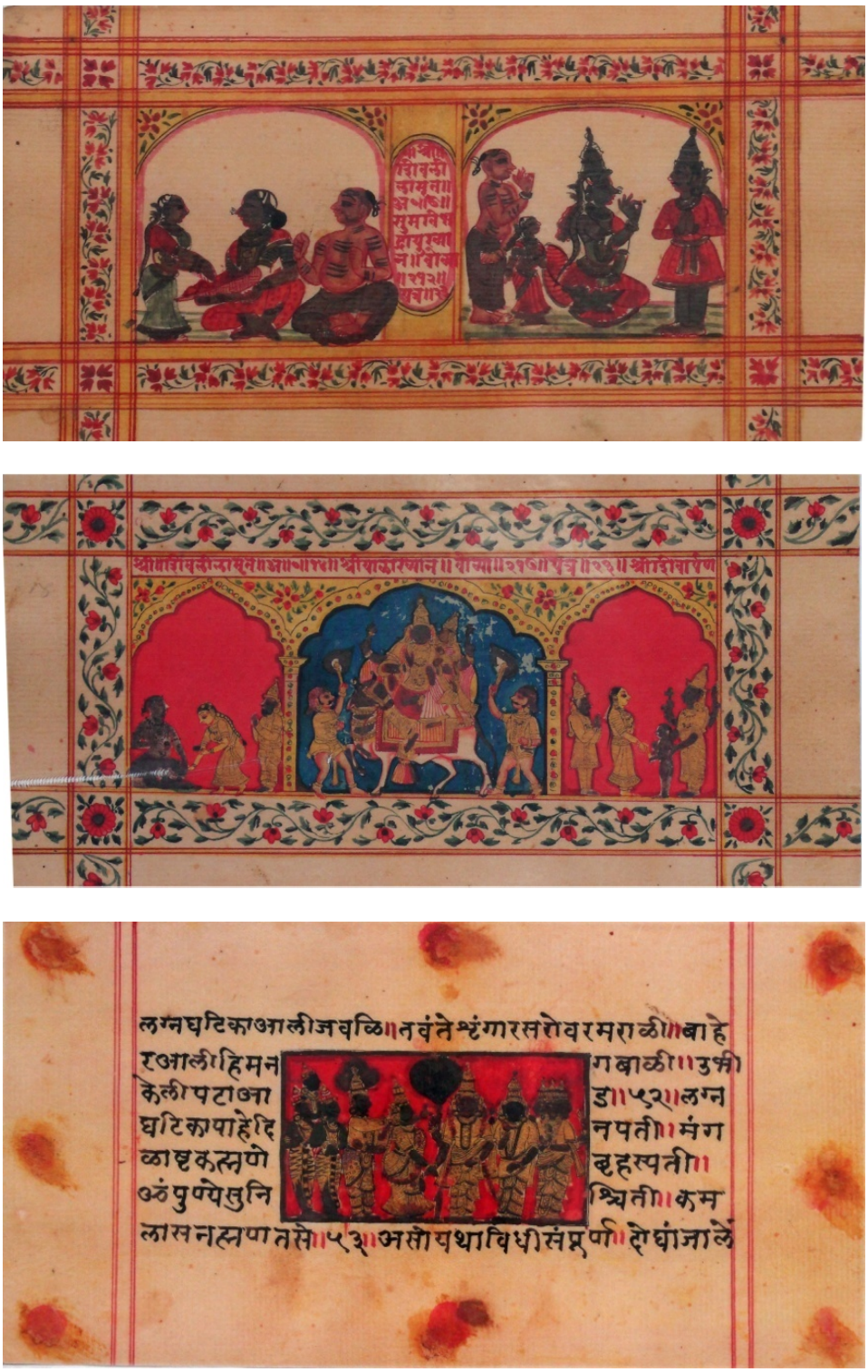
Use of rubrics to highlight text



Narrative illustrated story board

Appendix B 3: *Geeta Govinda*, 1765 AD, Courtesy: SVM

Embellishments of Margin Areas with Decorative Floral Patterns and Text Wrapped Illustrations



Appendix B 4: *Shivaleelamruta*, 1858 AD, Courtesy: SVM

Techniques in Binding, Form and Orientation of the Text

Saddle Stitch Binding

Key Features

- Saddle stitch type of binding
- Explorative layout design in terms of orientation of the text, introduction of columns
- Various types of text orientations incorporated in the layout which includes horizontal single column, horizontal double column, text directing towards inner margin and text directing towards outer margin
- Creep area has not taken into consideration. Creep area occurs when the inner pages extend further than the outer pages when folded.



Appendix B 5: Couplets, Date NA, Approx. 18th century, Courtesy: SVM

Fabric Book Covers

Key Features

- Border around text block, section binding, and portrait format are evidence of Islamic influence on the manuscript design.
- Use of section binding method to sew pages together
- Exclusive outer cover made up of silk cloth in with a decorative shape. String made up of cloth stitched along with the outer cover
- Margin area painted with yellow colour. Text block is white, left unpainted with two-line border painted around it. Inside margin, also two- line border drawn.



Appendix B 6 : *Samarthakrut Sundarkanda ani Yuddhakanda*, Date NA, Courtesy: SVM

Appendix C

Overview of the Distinctive Design Features of the Manuscripts from Other Cultures

During the course of study, apart from the seventeenth century Devanagari Brahmanical manuscripts, this researcher also came across with manuscripts related to the other cultures, listed below. Their specific features are enumerated below. The manuscripts noticed are from following cultures:-

(1) Jaina Manuscripts;

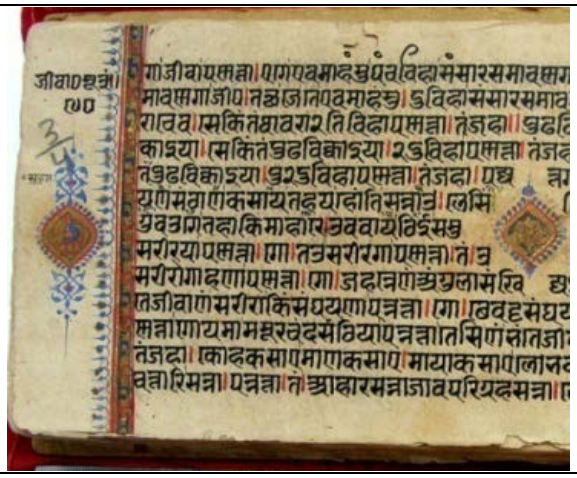
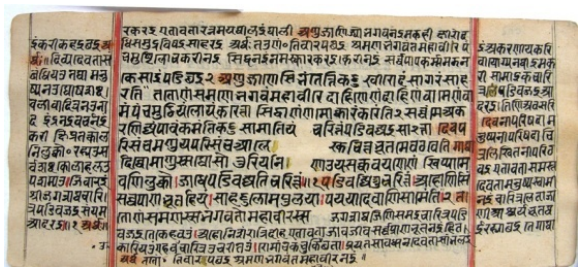
(2) Persian / Islamic Manuscripts;

(3) European Manuscripts

(4) Hebrew Manuscripts

Jaina manuscripts: Distinctive Layout Design features

No.	Representative Manuscript	Features
1		• Script: Jaina Devanagari • Style: Calligraphic • Blank rectangular space in the center of manuscript • Manuscript format text • Horizontal orientation
	Appendix C4: *Dynatadharmakathangasutra*, 1568 AD, Courtesy: BORI	
2		• Blank rectangular space in the center decorated with filled red circles or illustrated with motifs in the margin areas. • Space between border lines painted
	Appendix C5: *Prajnyapanasutra*, 1493 AD, Courtesy: BORI	

3		• Blank rectangular space in the vertical center, highly ornamented with colourful motifs • Margin areas also decorated with colourful motifs • Border lines illustrated with multi colour pattern. Illustration patterns and their style imitated in most of the Jaina manuscripts
	Appendix C6: *Jeevabhigamsutra*, 1500 AD, Courtesy: BORI	
4		• Layout style: *tripatha* • Principle text is written in the vertical center part, in bigger size than the commentary written above and below the text. • Visual hierarchy is employed in the layout through calligraphy
	Appendix C7: *Tripatha* Layout Style, *Prajnaparamitasutra Tikasahita*, Courtesy: BORI	
5		• Layout style: *Panchapatha* • Principle text is written in the horizontal and verticalcentre part of page. Commentary is written on four sides of principle text.
	Appendix C8: *Panchapatha* Layout Style, *Samavayangatika*, 1493 AD, Courtesy: BORI	
6		• Variations in font size along with dintinctive use of colour shows visual hierarchy • Use of rubrics • Division of space • Text is written in boxes
	Appendix C9: Visual Hierarchy in Text, *Sangrahami Sutra*, 1700 AD, Courtesy: Salar Jung Museum, Hyderabad	

7		• Highly illustrative figures with profuse use of gold, silver, red and lapis-lazuli colours
	Appendix C10 : Highly illustrative Jain Manuscript of *Kalpasutra*, Early 16th Century, Courtesy: VAM	

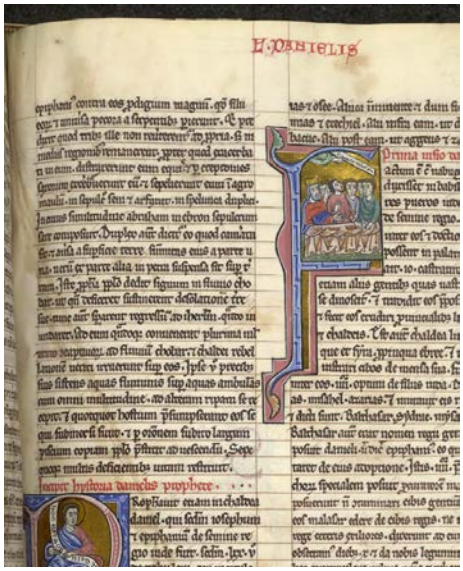
Islamic /Persian Manuscripts: Distinctive Layout Design features

No.	Representative Manuscript	Features
8	 Appendix C11: *Dah Pand-i-Hakim Aristo* [A Book on Good Counsels], Courtesy: VMHK Styles - Seven well-known calligraphic styles *Nastaliq*, *Kufic*, *Naskh*, *Thulth*, *Riqa*, *Diwan*, and *Tugra* are noticed in other manuscripts	• Script: Excellent form of calligraphy with fair penmanship • *'Bahar'* style introduced by Indian Islamic calligraphers in the 14th Century • Text is written on a ground dusted with gold • Generous use of gold colour • In exclusive Islamic manuscripts, the space between the line i.e. negative areas filled with gold colour to generate the concrete forms
9		• Book format • Vertical orientation • Mirror image page layout for left and right pages • Active white space • Use of columns in a page layout • Rubrics to highlight text
	Appendix C 12: *Ain-i-Akbari*, Courtesy: www.museumsofindia.gov.in, VMHK	

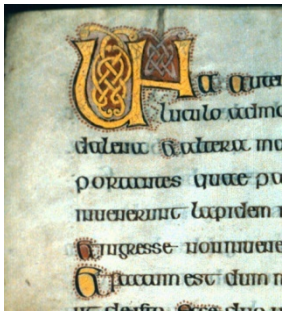
10		• Narrative paintings text wrapped along with the story • Gold ruled margins
	Appendix C13: *Anvar-i Suhayli by Kashifi*, 1504-5 AD , Courtesy: BL, MS 18579	
11	   (A) (B) (C) Appendix C14 (A): *Jahangir Nama*, , Early 17th century AD Courtesy: www.museumsofindia.gov.in, NMND (B) *Shamakhi Anthology*, , 1468 AD Courtesy: BL, MS 16561 (C) Preface by *Sa'dīand* 15 other texts, 1034 AD Courtesy: BL MS, IO Islamic 843	
	• Ornamented titles of the topics • Paper used for writing is sprinkled with gold dust • Margins beautifully decorated in gold with floral designs and animal motifs • Complex, decorative multiple frames around the text and illustrations. • Page borders made up of arabesque floral and geometric repetitive patterns	

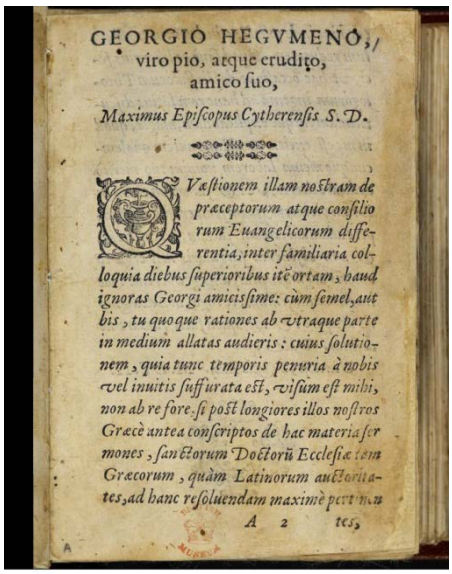
12		• Beautifully crafted cover pages • Codex format • Islamic binding; use of brown leather, medallion and corners outlined in gold, gold borders
	Appendix C15: Leather Binding, Anvar-i Suhayli, 1504-5 A.D Courtesy: BL, MS 18579,	

European Manuscripts: Distinctive Layout Design features

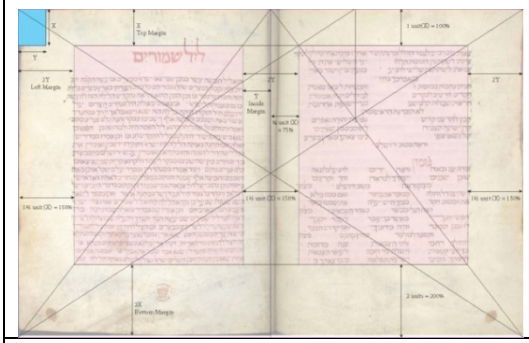
No.	Manuscript	Features
13	 	
	Appendix C16: Stowe MS 5, Courtesy: BL, www.bl.uk/catalogues/illuminated manuscripts/reuse.asp	
		• Two major standardized scripts: Carolingian Minuscule and Gothic script • Styles: Calligraphic, humanist • Produced in Europe until 1450; in later period, printing revolution began and typography developed • Book format with vertical orientation and codex binding • Mirror image page layout for left and right pages • Active white space • Use of columns in page layout • Insertion of rubrics to highlight text

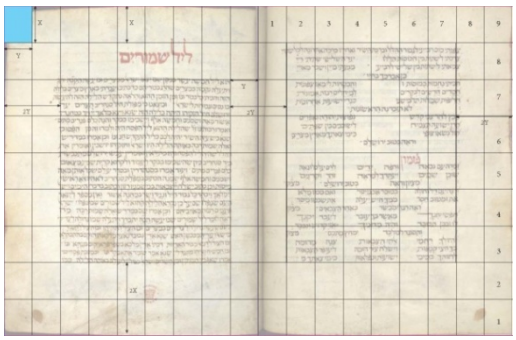
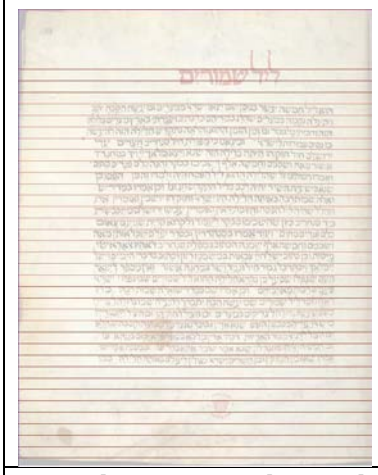
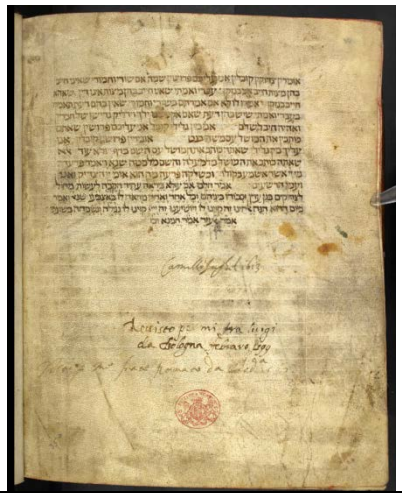
	• Colophon at the end of the manuscript with details and facts about manuscript • Illustrated and decorated manuscripts with the dazzling effect of gold leaf • Produced with extra care and design sensitivity • Manuscripts ruling on page done by lead or crayon, which leaves faint, marks of line on paper. Crayon leaves leaves dark, thick line mark on paper. • By third century BCE, monastic Graphic artist started designing majestic manuscript design with expensive purple colour, and text in silver and gold. Letter styles developed in late antique period and early Christian period, and continued until ninth century. Style is simple, fast in writing and easy in letterform, called *'Uncial'* means it written between two guidelines and distance between these two guidelines was one *'uncia'* (Roman inch). Uncial style actually invented by the Greeks in early third century BCE. Book available in church displayed at alter is written in very good script and ornamented, illuminated and decorated. • All manuscripts did not contain decoration and illustrations. Amount and format of illustration, varies as per the purpose of the book. • Notebooks of 11th century e.g. mathematics books for education available at National Library of the Netherland, at Hague, were not fancy. Some book forms are in the ratio of 1:0.7, some are narrow, some are broader with no title page, or publisher details.	
14		• Ornamented script and beautiful pen flourished calligraphy • Calligraphic decorative extension applied for ascending and descending strokes
	Appendix C17: A 'Cadel' - calligraphic decorative letters (Illuminated Manuscripts, Glossaries), 3rd quarter of 15th Century, Courtesy: BL	
15		
	Appendix C18: French Manuscripts with Calligraphic text, crayon ruling and ornamented text frame, Courtesy: British Library	

	• Use of Celtic patterns with complex designs and pure -bright colours • Illustrations placed in juxtaposition with the text • Full page illustrations • Full page ornamented frames and borders to enclose illustrations • Use of graphic principle *diminuendo*, the term means decreasing scale of graphic information.
	• Books had leather covers and were bound between wooden boards. Scribes were trained in writing text in style. Illuminators and illustrators were provided visual support by ornamenting the page. *Scrittori* or a scholar used to control entire process of production including page content planning.
16	  
	Appendix C19 : Enlarged decorated initials, (Illuminated Manuscripts, Glossaries) Courtesy: BL
	• Ornamented large initial used in the beginning of the chapters along with full page decorative design i.e. carpet design. • Minor initials mainly set at the left edge of the text margin and are of two lines in height most commonly used as a form of decoration in the thirteenth and fourteenth centuries in French manuscripts. • Variety of colours, such as red, blue, green and yellow were used in the twelfth century. In the thirteenth century, red and blue colours were used for minor initials in alteration for different stories or only red has been used. • Enlarged decorated initials are the characteristic of Romanesque period and they are defined according to their styles – Decorative, Zoomorphic, Gymnastic, Inhabited, historiated.

17	 GEORGIO HEGVMENO,/ viro pio, atque erudito, amico suo, *Maximus Episcopus Cytherensis S. D.* *Vestionem illam nostram de præceptorum atque consilio rum Euangelicorum differentia, inter familiaria colloquia diebus superioribus ité ortam, haud ignoras Georgi amicissime: cùm semel, aut bis, tu quoque rationes ab utraque parte in medium allatas audieris: cuius solutionem, quia tunc temporis penuria à nobis vel inuitis suffurata est, visum est mihi, non ab re fore, si post longiores illos nostros Græcè antea conscriptos de hac materia sermones, sanctorum Doctorũ Ecclesiæ tam Græcorum, quàm Latinorum auctoritates, ad hanc resoluendam maximè pertinentes,* A 2	• Humanistic writing • Variations in the size of heading, subheading, and body text indicating the visual hierarchy • Fully developed logical layout in the late-17th century • Pages in the form of bifolium bound together in the form of quires. • For firm binding wooden boards used to protect stack of quires. Limp binding was very much popular in the medieval period. Manuscript covered by leather, silk
	Appendix C20: 17th century content catalogue of Greek manuscripts in Latin and Greek, MS 22039, Courtesy: BL	

Hebrew Manuscripts - Distinctive Layout Design features

No.	Manuscript	Features
18		• Script – Square form • Book format with vertical orientation and codex binding • Mirror image page layout for left and right pages • Active white space • Use of columns in page layout
	Appendix C 21 : Golden Hagadah - Hebrew manuscript 14th-17th century, Courtesy: BL	
19		• Use of grid structure in the layout • Geometrical method employed for dividing space. • Van de Graff grid
	Appendix C 22 : Van de Graff grid, Hebrew manuscript, 14th-17th century, Courtesy: BL	

20		• Geometrical division of space – In this method, page has 81 units; height divided in 9 units and width divided in 9 units. • Units are used to define margins on the page
	Appendix C 23 : Geometrical division of space - 9 x 9 grid, Hebrew manuscript, 14th-17th century, Courtesy: BL	
21	 	
	Appendix C 24: Baseline grid, Hebrew manuscript, 14th-17th century, Courtesy: BL	
	•Template design: Page divided vertically to form horizontal baseline grid •Visible ruling	
22		
	Appendix C 25: Illumination of text, Hebrew manuscript, 14th-17th century, Courtesy: BL	
	• Illuminations of the text with gold, silver, and occasionally coloured letters of foremost and striking words, placed within coloured designs.	

References

1. (1991, March/April). *Print magazine* .
2. (2013, 7 8). Retrieved 7 8, 2015, from SikhMuseum.com: http://www.sikhmuseum.com/ words/manuscripts/manuscript4.html
3. Abhyankar, K. V. (1986). *A Dictionary of Sanskrit Grammar.* Baroda, Gujarat, India: Oriental Institute of Baroda.
4. Alessio, J. (2013, January 17). *Understanding The Difference Between Type And Lettering.* Retrieved May 16, 2015, from Smashing Magazine: http://www.smashingmagazine.com
5. Alistair Dabbs, K. M. (2005). *InDesign Production Cookbook.* (A. Dabbs, Ed.) "O'Reilly Media, Inc.".
6. Ambrose, & Harris. (2008). *Grids.* Switzerland: AVA Publishing SA.
7. Ambrose, G., & Harris, P. (2011). *Basic Design 02 Layout* (2 ed.). Singapore: AVA Publishing.
8. Ambrose, G., & Harris, P. (2010). *The Visual Dictionary of Typography : Visual Dictionaries.* Switzerland: AVA Publishing SA.
9. *An introduction to Medieval scripts.* (2016). Retrieved February 28, 2016, from Making the medieval book: https://www.khanacademy.org/humanities/medieval-world/medieval-book/making-medieval-book/v/an-introduction-to-medieval-scripts
10. An Introductory Manual of Devanagari Calligraphy. (2015). Aksharaya.
11. Arntson, E. E. *Graphic Design Basics* (4 ed.). Australia, Canade: Thomson Wordsworth.
12. *Art Movements*. (n.d.). Retrieved May 21, 2016, from Art Movements Directory: http://www.artmovements.co.uk/surrealism.htm
13. Aynsley, J. (2005). Graphic Design. In H. Conway (Ed.), *Design History - A Students' Hand Book.* New York: Harper Collins Academy.
14. Balaram, S. (Ed.). (2001). *Design Quotes.* Ahmedabad: National Institute of Design.
15. Barnard, M. (2005). Graphic Design and Communication. In M. Barnard, *Graphic Design As Communication* (p. 10). New York, USA: Routledge.
16. Bear, J. H. (2013). *Use Less Clip Art: Desktop Publishing Rules of Image Usage*. Retrieved 2 14, 2013, from About.com: http://desktoppub.about.com /cs/graphicsuse/a/ clipartclutter.htm

17. Bear, J. H. (2013). *White Space: How to Add White Space to a Page Layout.* (about.com) Retrieved 2 14, 2013, from About.com: http://desktoppub.about.com/cs/ designprinciples/ht/white_space.htm?p=1

18. Betala, R. (2005). Understanding Design. In R. Betala, *Design - Comprehension & Visualisations.* New Delhi: Ane Books.

19. Bhagwat, S. V. (1961). *Phoniemic Frequencies in Marathi and Their Relation to Devising a Speed-script.* Pune, India: Deccan College Post-graduate and Research Institute.

20. Bhoi, P. (2010). Scribe as Metaphor: Patterns of Processing and Writing Palm leaf Manuscripts. *Indian Anthropologist , 40* (1), 71-92.

21. Bibliothèque nationale et universitaire de Strasbourg, C. B. (1975). *Catalogue of the Jaina Manuscripts at Strasbourg* (Vol. 4). Brill Archive.

22. Bibliothèque nationale et universitaire de Strasbourg, C. B. (1975). *Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis* (Vol. 4). Strasbourg: Brill Archive.

23. Bloomer, P. (n.d.). How New Tehnologies Are Changing Typography: The Breaking of the Tyranny of Arial. *Academia.edu* .

24. Bokil, P. (2009, july 42-48). Functions of Grid, a key for flexibility in framework. *Design Thoughts* .

25. Bordeau, J. (2010, May 18). *Design : Typography : Writing System and Calligraphy of the World: Smashing Magazine*. Retrieved 11 May, 2015, from Smashing Magazine: http://www.smashingmagazine.com/

26. Bright, W. (1996). South Asian Writing Systems: The Devanagari Script. In W. B. Peter T. Daniels (Ed.), *The World's Writing Systems* (p. 384). New York: Oxford University Press, Inc.

27. Bright, W. (1996). South Asian Writing Systems: The Devanagari Script. In W. B. Peter T. Daniels (Ed.), *The World's Writing Systems.* New York: Oxford University Press, Inc.

28. Busby, K., Nixon, T., Stones, A., & Walters, L. (Eds.). (1993). *Les Manuscrits de Chrétien de Troyes* (Vol. 2). Netherlands: Rodopi.

29. Buttolph, J., & Reynolds, H. T. (2015, February). *http://college.cqpress.com/sites/psrm /Home/chapter7.aspx*. (C. Press, Producer, & Sage Publications) Retrieved February 15, 2015, from http://college.cqpress.com/.

30. Chande, B. (1997). *The Police in India.* New Delhi: Atlantic Publishers and Distributors.

31. Chisnell, D. E., Becker, S. C., Laskowki, S. J., & Lowry, S. Z. (2009). *Style Guide for Voting System Documentation.* (N. I. Technology, Ed.) DIANE Publishing.

32. Craig, R. (1990). Ideological Aspects of Publication Design. *Design Issues , VI* (2), 18-27.

33. David Dabner, S. C. (2010). A Foundation Course for Graphic Designers Working in Print, Moving Image and Digital Media (4 ed.). London: Thames & Hudson.

34. Deer, T. R. (2006). *Exploring Typography* (2 ed.). USA: Cengage Learning.

35. Derolez, A. (2003). The Palaeography of Gothic Manuscript Books: From the Twelfth to the Early Sixteenth Century. Cambridge: Cambridge University Press.

36. Dr. S. M. Katre. Language and Literature. In *Maharashtra State Gazetteer.*

37. EFEO Bangkok Centre. (n.d.). *Lanna manuscripts, Manuscripts and Tools*. Retrieved July 11, 2015, from http://www.efeo.fr/lanna_manuscripts/taxonomy/term/92: http://www.efeo.fr

38. *Enhance Your Yearbook Page Layouts with the Golden Ratio*. (2015, October 5). Retrieved June 15, 2016, from TreeRing: http://blog.treering.com/enhance-yearbook-page-layouts-golden-ratio/

39. (2009). Foundations of Graphic Design. In S. Uppal (Ed.), *The Story of Graphic Design* (p. 3). Delhi, India: National Council of Educational Research and Training.

40. Frost, C. (2012). *Designing for Newspapers and Magazines* (2 ed.). USA, Canada: Routledge.

41. Gajrani, S. (2004). *History, Religion and Culture of India* (Vol. 3). (S. Gajrani, Ed.) New Delhi: Gyan Publishing House.

42. Galambos, I. (2014). Punctuation Marks in Medieval Chinese Manuscripts. (D. B.-U. Jörg Quenzer, Ed.) *Manuscript Cultures: Mapping the Field , Volume 1 of Studies in Manuscript Cultures*.

43. Garcia, M. R. (1987). Graphic Strategies. In M. R. Garcia, *Contemporary Newspaper Design.* New Jersey, USA: Prentice Hall, Englewood Cliffs.

44. Gaur, D. R., & Chakraborty, M. (2009). Preservationa and Access to Indian Manuscripts : A Knowledge Base of Indian Cultural Heritage Resources for Academic Libraries. *International Conference on Academic Libraries (ICAL-2009).* New Delhi: University of Delhi.

45. Gaur, R. (2011). PRESERVATION AND ACCESS TO MANUSCRIPT. *International Journal of Information Research , 1* (1), 1-15.

46. Gavin Ambrose, P. H. (2011). *Basics Design 02: Layout: Second Edition* (Second ed.). AVA Publishing.

47. Gode, P. K. (1969). A Brief Note on the History & Progress of Cataloguing of Sanskrit & Other MSS . In P. K. Gode, *Studies in Ancient Indian History* (p.

374). Pune, Maharashtra, India: Prof. P. K. Gode Collected Work Publication Committe; BORI.

48. Gohad, C. (n.d.). *History of Devanagari Letterforms.* Retrieved May 16, 2015, from http://www.dsource.in/resourcel: http://www.dsource.in

49. Gokhale, M. (1983). Design Parameters of Devanagari. In L.S.Wakankar (Ed.), *CALTIS83.* Pune: CALTIS83.

50. Gokhale, M. (2008). Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha. Pune, India: Nirali Prakashan.

51. Golombisky, K., & Hagen, R. (2010). *White Space Is Not Your Enemy.* USA: UK: Elsevier Inc.

52. Gough, E. (2012). SHADES OF ENLIGHTENMENT A JAIN TANTRIC DIAGRAM AND THE COLOURS OF THE TĪRTHAṄKARAS . (I. J. Studies, Ed.) *International Journal of Jaina Studies , 8* (2), 1-47.

53. Graham, L. (2012). Basics of Design: Layout & Typography for Beginners (2nd ed.). Cengage Learning.

54. (2009). Graphic Art Design and Graphic Design. In S. Uppal (Ed.), *The Story of Graphic Design* (p. 13). Delhi: National Council of Educational Research and Tranining.

55. *Graphic Design.* (n.d.). Retrieved January 2015, 2015, from wikipedia: http://en.wikipedia.org/

56. Hashimoto, A., & Clayton, M. (2009). *Visual Design Fundamentals, A Digital Approch* (Vol. Third). Boston, USA: Cengage Learning.

57. Haslam, A. (2006). *Book Design.* UK: Laurence King Publishing.

58. Hebbar, P. G. (1988). *Bharatiya Lipinche Moulik Ekrupa.* (S. Modak, Ed.) Mumbai, India: Maharashtra Rajya Sahitya Ani Sanskruti Mandal.

59. Henss, M. (2007, December 25). *TIBET – Monasteries Open Their Treasure Rooms –.* Retrieved February 8, 2016, from asianart.com: https://www.asianart.com/articles/henss/index.html#13

60. *History and Civics.* (2011). New Delhi: Frank Brothers Co. (Publisher) Ltd.

61. *http://researchcenter.waldenu.edu/Documents/Grounded_Full_Captions.pdf.* (n.d.). Retrieved February 1, 2015, from http://researchcenter.waldenu.edu/: http://researchcenter.waldenu.edu/Documents/Grounded_Full_Captions.pdf

62. Ian Noble, R. B. (2005). Visaul Research, An Introduction to Research Methodologies in Graphic Design. Switzerland: AVA Publishing SA.

63. *Illuminated Manuscripts, Glossaries*. (n.d.). (British Library) Retrieved August 3, 2015, from www.bl.uk/catalogues/illuminatedmanuscripts/GlossC.asp: www.bl.uk / catalogues / illuminatedmanuscripts/GlossC.asp

64. *Illuminated Manuscripts, Glossaries*. (n.d.). (British Library) Retrieved August 3, 2015, from Catalogue of Illuminated Websites: www.bl.uk

65. *Indesign Tutorial #3 – Interview Article*. (2010, Septemeber 21). Retrieved July 3, 2016, from Nick Cassaway's design Blog: http://nickcassway.com/designblog/?p=356

66. India, A. S. (2003, 7 5). *Rock Shelters of Bhimbetka.* Retrieved 1 4, 2015, from http://whc.unesco.org/uploads/nominations/925.pdf: http://whc.unesco.org

67. *Indian Manuscripts: What is Manuscript*. (2007). (N. M. Manuscripts, Producer, & Ministry of Tourism and Culture,Government of India) Retrieved 5 21, 2015, from http://www.namami.org/whatismenuscript.htm: http://www.namami.org/whatismenuscript.htm

68. *Islamic Manuscript Network.* (n.d.). Retrieved February 14, 2016, from http://www.islamicmanuscripts.net/: http://www.islamicmanuscripts.net/uploads/1/6/7/1/16716552/599451_orig.jpg?373

69. J., Z. (1977). Peirce's Theory of Signs.

70. Jatoo, D. S. (2013-14, April-March). Gilgit Manuscripts:A Frozen Wisdom. (M. Chakraborty, Ed.) *Kriti Rakshna , 8, 9* (5-6, 1-4), pp. 25-27.

71. *Jnātadharma-kathā (Prakrit d. 4)*. (2016). (Institute of Jainology) Retrieved February 14, 2016, from Jainpedia, The Jain Universe Online: http://www.jainpedia.org /manuscripts/detail-view-meta/manuscript/jnatadharma-katha-prakrit-d-4/opening-page-floral-decoration-2.html

72. Joshi, R. (1983). Calligraphic Study of Manuscripts. In *CALTIS.*

73. Joshi, R. (1984). Calligraphy the Art of Writing. *Calligraphy, Lettering & Typography of Indian Script.* New Delhi: CALTIS 84.

74. Kak, S. C. (1994). Evolution of Early Writing in India. *Indian Journal of History of Sciences , 29* (3), 375.

75. Kapoor, S. (Ed.). (2002). *The Indian Encyclopaedia: India (Central Provinces)-Indology* (Vol. 11). New Delhi, India: Genesis Publishing Pvt Ltd, 2002.

76. Kapoor, S. (Ed.). (Genesis Publishing Pvt Ltd). *The Indian Encyclopaedia: Mahi-Mewat* (Vol. 15).

77. Kiiniaja, G. S. (2010). Styles of Islamic Calligraphy in Manuscripts. In P. K. Palit, & P. K. Subodh Gopal Nandi (Ed.), *Manuscript and Manuscriprology in India* (p. 197). New Delhi: Kaveri Books.

78. Kohei, S. (2014). A Cosmos Full of Characters. In S. Kohei (Ed.), *Books, Letterforms and Design in Asia : Sugiura Kohei in Conversation with Leading Asian Designers* (A. G. Jan Fornell, Trans., English ed., pp. 91-92). Mumbai: ADARG and The Marg Foundation.

79. Kohei, S. (2014). Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi. In S. Kohei (Ed.), *Books, Letterforms and Design in Asia* (A. G. Jan Fornell, Trans., English ed., pp. 260-299). Mumbai: ADARG and The Marg Foundation.

80. Kohei, S. (2014). Delivery Traditional Culture to Future Generations: Books, Letterforms and Design in East Asia. In *Books, Letterforms and Design in Asia: Sugiura Kohiei in Conversaton with Asian Designers* (A. G. Jan Fornell, Trans., pp. 42-75). Mumbai, India: ADARG and The Marg Foundation.

81. Krause, J. (2004). *Design Basics Index.* Cincinati, Ohio: How Design Books.

82. Kumar, V. (Ed.). (1975). *Committees and Commissions in India, 1947-73: 1977 (4 v.)* (Vol. 15 Issue 3). Concept Publishing Company.

83. Kumar, V. (Ed.). (1993). *Committees and Commissions in India, 1947-73: 1977 (4 v.)* (Vol. 15 Issue 3). Concept Publishing Company.

84. Kwakkel, D. E. (2016). *Making the medieval book*. (khanacademy.org) Retrieved February 28, 2016, from khanacademy: https://www.khanacademy.org/humanities/medieval-world/medieval-book/making-medieval-book/a/clasps-hugging-a-medieval-book

85. Kwakkel, D. E., & Harris, D. B. (2016). *Making the medieval book.* Retrieved February 28, 2016, from Art of Medieval Europe: https://www.khanacademy.org/humanities/ medieval-world/medieval-book/making-medieval-book/v/medieval-textbook

86. Lupton, E. (2012, 3 1). *Articles:Typographic Hierarchy: Indian Type Foundry*. Retrieved 5 8, 2015, from Indian Type Foundry: http://www.indiantypefoundry.com

87. *Manuscripts*. (n.d.). Retrieved July 11, 2015, from http://www.jainpedia.org/: http://www.jainpedia.org

88. Maurer, W. H. (1976). On the Name Devanagari. *Journal of the American Oriental Society , Vol. 96* (No. 1), 101-104.

89. McIntosh, J. R. (2008). Early Framers in Northwest South-Asia (7000-4300 BCE). In J. R. McIntosh, & A. A. Moore (Ed.), *The Ancient Indus Valley, New Perspective.* Santa Barbara: ABC-CLIO, Inc.

90. Megges, P. B., & Purvis, A. W. (2012). Postmodern Design. In P. B. Meggs, & A. W. Purvis, *Meggs' History of Graphic Design* (5th Edition ed.). NewJersey: John Wiley & Sons, Inc.

91. Megges, P. B., & Purvis, A. W. (2012). The Influence of Modern Art. In P. B. Megges, & A. W. Purvis, *Megg's History of Graphic Design* (5th Edition ed.). New Jersey, USA: John Wiley & Sons, Inc.

92. Meggs, P. B., & Purvis, A. W. (2012). Illuminated Manuscripts. In P. B. Meggs, & A. W. Purvis, *Meggs' History of Graphic Design* (Fifth ed., pp. 46-47). New Jersey, Hoboken, USA: John Wiley & Sons.

93. Meggs, P. B., & Purvis, A. W. (2012). Preface. In P. B. Meggs, & A. W. Purvis, *Meggs' History of Graphic Design* (Fifth ed.). New Jersey, Hoboken, USA: John Wiley & Sons, Inc.

94. Menon, A., & Kusuman, K. (1990). A Panorama of Indian Culture: Professor A. Sreedhara Menon Felicitation Volume. New Delhi: Mittal Publications.

95. *Midnight's Children Resources.* (n.d.). Retrieved 1 5, 2016, from Columbia University: http://www.columbia.edu/itc/mealac/pritchett/00routesdata/bce_500back/indusvalley/yogi/yogi.html

96. Montgomery Schuyler, J. (1908). Notes on the Making of Palm-Leaf Manuscripts in Siam. *Journal of the American Oriental Society , Vol. 29*, 281-283.

97. Murthy, R. S. (1996). *Introduction to Manuscriptology.* Delhi: Sharada Publishing House.

98. Murthy, R. S. (1996). *Introduction to Manuscriptology*. New Delhi, India: Sharada Publishing House.

99. Museum and the Victoria & Albert Museum', British Library and Institute of Jainology (Vol. 2). (2006). London.

100. *Museumsofindia*. (n.d.). (Victoria Memorial Hall, Kolkata) Retrieved January 7, 2016, from http://www.museumsofindia.gov.in/repository/record/vmh_kol-R9279-16703 © Victoria Memorial Hall, Kolkata (7 January, 2016).: http://www.museumsofindia.gov.in/repository/record/vmh_kol-R9279-16703

101. Naik, B. S. (1965). *Typography of Devanagari* (1971 ed., Vol. 1). Bombay, India: Diroctorate, Govt. Printing and Stationary.

102. Naik, P., & Dalvi, G. (2015). Calligraphic analysis of the Jain Manuscript Style. *Typoday 2015* (pp. 1-16). http://www.typoday.in.

103. Ojha, G. H. (1977). *Bharatiya Prachin Lipimala (The Palaeography of India).* (D. L. Bharatiya, Trans.) New Delhi: Sahitya AKademy.

104. Olivelle, P. (2013). *King, Governance, and Law in Ancient India: Kautilya's Arthasastra.* (P. Olivelle, Trans.) New York, USA: Oxford University Press.

105. *Online Gallery, Virtual Books, Mewar Ramayan:The British Library*. (n.d.). (T. B. Board, Producer) Retrieved July 10, 2015, from http://www.bl.uk/onlinegallery/virtualbooks/index.html: http://www.bl.uk/onlinegallery/virtualbooks/index.html

106. Palit, P. K. (2010). *Manuscript and Manuscriprology in India.* (P. K. Subodh Gopal Nandi, Ed.) New Delhi: Kaveri Books.

107. Pangarkar, L. (Ed.). (1990). *Sarth Shri Dasbodha* (15 ed.). (L. Pangarkar, Trans.) Mumbai: D.B. Dhawale.

108. *Photo Gallery - Palm Leaf*. (2016). (National Mission for Manuscripts) Retrieved February 14, 2016, from National Mission for Manuscripts: http://www.namami.org /palmleaf/2.jpg

109. Prasad, P. (Ed.). (2007). Lekhapaddhati: Documents of State and Everyday Life from Ancient and Early Medieval Gujarat, 9th To15th Centuries (13 Jul 2010 ed.). Oxford University Press.

110. Punyavijay, M. (1938). *Bharatiya Jain Shraman Ane Lekhankala, 1938.* Retrieved June 1, 2015, from Jain Education International: http://jainlibrary.org

111. Purvis, P. B. (2012). The Digital Revolution and Beyound. In *Meggs' History of Graphic Design.* New Jersey: John Wiley & Sons, Inc.

112. *qualitative-research-3138560*. (2015). Retrieved February 8, 2015, from http://www.slideshare.net/jadallah/qualitative-research-3138560

113. *Quills and Pixels.* (n.d.). Retrieved June 30, 2016, from Aaron David Baker: http://aaronsayshi.com/design/quills-and-pixels

114. R. Cattoni, T. C. (1998, January). Geometric Layout Analysis Techniques for Document Image Understanding: a Review. Trento, Italy: ITC-irst.

115. *rafaelhdesigns*. (n.d.). Retrieved July 2, 2016, from http://www.rafaelhdesigns.com /project/kenzo-tange-page-layout/

116. Ramdas. (1990). *Sarth Dasbodha* (15 ed.). (L. Pangarkar, Ed., & L. Pangarkar, Trans.) Mumbai: D.B. Dhawale.

117. Rana, D. K. (2006, April). Cataloguing of Manuscript. (N. Paliwal, Ed.) *Kriti Rakshana* .

118. Ranade, M. P. (2015). Use of Eye Movement Tracking Technique in the Study of Layout and Composition Design of Medieval Indian Manuscrits. *Gloabal Journal of Interdisciplinary Social Sciences , Vol. 4* (2), 37-42.

119. Ranade, P. (2015). Form and Page Turning Function of 17th century Devanagari Manuscripts of Maharashtra (India) . *Chitrolekha International Magazine on Art and Design , 5* (2), 2-12.

120. Ranade, P. (n.d.). Use of Eye Movement Tracking Technique in the Study of Layout and Composition Design of Indian Manuscrits.

121. Ranade, U. (1983). *Manuscript Illustrations of the Medieval Deccan.* Delhi: B.R. Publishing Corporation.

122. Rand, P. (2014). *Thoughts on Design* (3 ed.). San Francisco: Chronicle Books.

123. Richard H. Meadow, J. M. (2016). *Early Developments of Art and Symbol and Technology in the Indus Valley Tradition.* Retrieved 2016, from https://www.harappa.com/indus3/e1.html.

124. Riordan, D. G., & Pauley, S. E. (2004). *Technical Report Writing Today* (8 ed.). New Delhi: Dreamtech Press.

125. Roberts, C. (2004). *New Book Design.* (R. Fawcett-Tang, Ed.) United Kingdom: Laurence King Publishing.

126. Ross, L. (2003). *Artists of the Middle Ages.* Westport, Westport: Greenwood Publishing Group.

127. Ross, L. (2014). Language in the Visual Arts: The Interplay of Text and Imagery. North Carolina: McFarland & Co.Inc.

128. Sahoo, J., Sahoo, B., Mohanty, B., & Dash, N. K. (2013, 6 30). Indian Manuscript Heritage and the Role of. *Library Philosophy and Practice (e-journal)* .

129. Sarkar, J. (1997). *Shivaji and His Times* (5 ed.). Mumbai : Orient Longaman Limited.

130. Sarkar, J. (2012). The General Study of Art as Reflcted in the Tradition of Few Illustrated Mss. in the Asiatic Society of Calcutta. In B. J. U.C. Dwivedi (Ed.), *Indian Art History Congress. XXI* , pp. 117-122. Kolkata: Indian Art History Congress.

131. Sathaye, T. b. (2015, 4 10). *Svaramanjari.* Retrieved 6 25, 2015, from www.sanskritdocument.org: http://sanskritdocuments.org/doc_z_misc_general/svaramanj.pdf

132. Satyendra, D. (1978). *Pandulipi Vijnan.* Jaipur: Rajasthan Hindi Grantha Akademy.

133. Serafini, F. (2011). Expanding perspectives for comprehending visual images in multimodal texts. *Journal of Adolescent \& Adult Literacy , 54* (5), 342-350.

134. Sherin, A. (2012). Communicating with Colour. In A. Sherin, Design Elements, Color Fundamentals: A Graphic Style Manual for Understanding How Color Affects Design. Beverly: Rockport Publishers.

135. Sherin, A. (2013). *Design Elements - Using Images to Create Graphic Impact.* Massachusetts, USA: Rockport Publishers.

136. (1998). Bhakti Movement: Some Perspectives. In M. Sivaramkrishna, & S. R. M. Sivaramkrishna (Ed.), *Poet Saints of India.* New Delhi, India: Sterling Publishers Pvt. Ltd.

137. Soudip. (2014, Oct 20). *Mehergarh Historical Facts and Figures.* Retrieved 1 5, 2016, from The History Hub: http://www.thehistoryhub.com/mehrgarh-facts-pictures.htm

138. Spiekermann, E., & Ginger, E. M. (2003). *Stop Steeling Sheep* (Second ed.). Californmia, USA: Peachpit Press.

139. Strauss, L., A., Corbin, M., J., & Strauss. (1998). Basics of Qualitative Research : Techniques and Procedures for Developing Grounded Theory. (2). California: Sage Publication.

140. Stribley, M. (2015, September 16). *10 Rules of Composition All Designers Live By*. Retrieved April 2016, 26, from Canva: https://designschool.canva.com/blog/visual-design-composition/

141. Stribley, M. (2015, April 14). *20 Design Rules You Should Never Break.* Retrieved June 30, 2016, from Design School: https://designschool.canva.com/blog/design-rules/

142. Tadvalkar, N. (2012). *Ephemeral floor art of India history tradition and continuity.* SNDT Womens University, Department of History.

143. *The Bottom Line: Should I Use a Baseline Grid?* (2007, September 18). Retrieved June 30, 2016, from Planet Quark: http://planetquark.com/images/posts/baselinegrid/grid04.jpg

144. Tibor, K., Miller, J. A., & Jacobs, K. (2015). *Good History / Bad History.* (Andrew, Mike, Rebecca, & Sebastian, Eds.) Retrieved May 25, 2015, from Print Magazine Web site: http://www.printmag.com/wp-content/uploads/GoodHistoryBadHistory.pdf

145. Tondreau, B. (2009). *Layout Essentials - 100 Design Principles for Using Grids.* Massachusettes, USA: Rockport Publishers, Inc.

146. Tondreau, B. (2009). *Layout Essentials - 100 Design Prniciples for Using Grids.* Massachusettes, USA: Rockport Publishers, Inc.

147. Tonny Seddon. (2011). *Grids - Creative Solutions for Graphic Designers* (2 ed.). Switzerland: Rotovision SA.

148. Transfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence - Informed Management Knowledge by Means of Systematic Review. *British Journal of Management , 14*, 207-222.

149. Tripathy, D. K. (2014, April-May). Development of Scientific Studies and Exploration of Indian Cultural Heritage. (M. Chakraborty, Ed.) *Kriti Rakshana , 9* (5), pp. 12-16.

150. Tripathy, D. K. (2014, April-May). Development of Scientific Studies and Exploration of Indian Cultural Heritage. (M. Chakraborty, Ed.) *Kriti Rakshana , 9* (5), pp. 12-21.

151. *Uttaradhyayana Sutra, Mahavira preaching*. (n.d.). Retrieved February 14, 2016, from British Library: http://www.bl.uk/onlinegallery/onlineex/expfaith/jainmanus/uttaradh/033ori0000013362u00001000.html

152. Velankar, H. D. (1998). *A Descrptive Catalogue of Sanskrit & Prakrit Manuscripts* (2 ed.). (D. D. V.M. Kulkarni, Ed.) India: The Asiatic Society of Bombay.

153. Vijay, M. P. Bharatiya Jain Shraman Sanskriti ane Lekhan Kala.

154. *Visible Signs*2003SwitzerlandAVA publishing SA

155. Vyas, H. K. (2000). *Design The Indian Context.* Ahmedabad, India: National Institute of Design.

156. Vyas, H. K. (2000). Design The Indian Context, Learning the Historical Rationale of the Indian Design Idiom. Ahmedabad, Gujarat, India: National Institute of Design.

157. Wakankar, L. S. (1968). Ganesh-Vidya:The Traditional Approach to Phonetic Writing. Mumbai: Script Study Group.

158. Wakankar, S. Y. (1983). Manuscript Writer and His Tools. (L. Wakankar, Ed.) *Calligraphy, Lettering, Typography of Indic Scripts* .

159. William Lidwell, K. H. (2003). *Universal Principles of Design.* Massachusetts, USA: Rockport Publisher, Inc.

160. Wong, W. (1972). *Principles of Two-Dimensional Design.* USA: John Wiley & Sons.

161. Wujastyk, D. (2014). Indian Manuscripts. In J. Quenzer, D. Bondarev, & J. Sobisch (Eds.), Manuscript Cultures: Mapping the Field (pp. 159-182). Berlin, Boston.

162. Y.K.Bukhari. (1963, March). Pigments. *MARG , XVI* (2).